UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

JUL 20 2015

REPLY TO THE ATTENTION OF:

Via US Mail

Mr. Matthew Love
Excide Technologies
P.O. Box 14294
Reading, Pennsylvania 19612-4294

RE: Explanation of Significant Differences
Refined Metals Corporation
3700 South Arlington Avenue
Beech Grove, Indiana
IND 000 718 130

Dear Mr. Love,

On August 31, 1998, the Refined Metals Corporation (RMC) entered into a Consent Decree (CD) with the U.S. Environmental Protection Agency and the Indiana Department of Environmental Management (IDEM). The CD required RMC to close waste piles and a surface impoundment in accordance with IDEM requirements and conduct a corrective action program subject to EPA review and approval. RMC completed corrective action investigations and provided the results to EPA and IDEM.

EPA reviewed the investigation reports and on September 15, 2009, issued its Final Decision requiring RMC to implement remedial measures necessary to protect human health and the environment. As a final remedy, EPA required RMC to:

- Excavate contaminated media, including soils, sediment, and debris. Demolish several remaining facility structures, and consolidate the remediation waste into an on-site containment cell.
- Place an institutional control on the property to restrict land and groundwater use.
- Conduct monitored natural attenuation to restore contaminated groundwater on the facility.

RMC began implementing the final remedy in August, 2014. During excavation, RMC discovered more waste than was previously known, requiring that the additional material be placed into the on-site containment cell. On June 16, 2015, RMC requested EPA approval to expand the containment cell to provide capacity for the additional remediation waste. RMC

estimates that an additional 13,261 cubic yards of waste requires excavation and consolidation. RMC proposes to expand the containment cell to provide the additional capacity, using similar construction methods and materials as the original cell.

EPA has reviewed RMC's request and is approving the June 16, 2015, Request for Amendment to the Corrective Measures Design in accordance with paragraph 49 of the CD. RMC is responsible for ensuring continued compliance with the CD and all applicable provisions of RCRA, and the following conditions of approval:

1. Provide as-built drawings in the Corrective Measures Implementation Report.
2. Within 45 days of construction completion, RMC will provide a revised Operation and Maintenance Plan incorporating final design and monitoring requirements.

Any departure from the conditions of this approval must receive prior written authorization from this office. Further, these approvals do not relieve the Owner from compliance with any other Federal, State, or local regulatory requirements. If you have any questions regarding this approval, please contact Ms. Ohl by e-mail at ohl.tamara@epa.gov or by telephone at (312) 886-0991.

Sincerely,

Margaret M. Guerriero
Director
Land and Chemicals Division

Enclosure

cc: Ruth Jean, IDEM

EXPLANATION OF SIGNIFICANT DIFFERENCE

FOR THE

REFINED METALS CORPORATION

BEECH GROVE, INDIANA

IND 000 718 130

JULY, 2015

Issued by: **Date:**

7/20/2015

Margaret M. Guerriero
Director
Land and Chemicals Division
U.S. Environmental Protection Agency

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EXPLANATION OF SIGNIFICANT DIFFERENCE

Refined Metals Corporation

Beech Grove, Indiana

IND 000 718 130

EXPLANATION OF SIGNIFICANT DIFFERENCE

Refined Metals Corporation

Beech Grove, Indiana

IND 000 718 130

I. PURPOSE

The U.S. Environmental Protection Agency issued a Final Decision and Response to Comments (Final Decision) on September 14, 2009, for the Refined Metals Corporation (RMC) facility, located in Beech Grove, Indiana. The Final Decision required RMC to excavate contaminated soils and sediments, demolish several remaining facility structures, and consolidate the remediation waste into an on-site containment cell. In addition, the Final Decision required RMC to place an institutional control on the property deed restricting the use of the land and groundwater, and to conduct a monitored natural attenuation program until the groundwater is restored.

This Explanation of Significant Difference (ESD) documents EPA's decision to significantly change part of the final remedy. The significant change to the remedy is the decision to expand the existing containment cell to receive a greater volume of remediation waste discovered during remedy implementation. The changes do not fundamentally alter the overall cleanup approach, and comply with the statutory requirements of the Resource Conservation and Recovery Act (RCRA), as amended, 42 U.S.C. § 6901 et seq.

II. FACILITY DESCRIPTION AND SELECTED REMEDY

The Refined Metals Corporation (RMC) is located at 3700 South Arlington Avenue in Marion County, Beech Grove, Indiana. RMC received lead acid automotive and industrial batteries, and lead-bearing materials which were processed for lead recovery. RMC occupies approximately 24 acres of relatively flat land of which about 10 acres was formerly used for manufacturing. The facility was used for secondary lead smelting and refining operations from 1968 through 1995. On August 31, 1998, RMC entered into a Consent Decree with EPA and the Indiana Department of Environmental Management (IDEM) pursuant to Section 3008(a) of RCRA. The Consent Decree required RMC to close waste piles and a surface impoundment pursuant to a closure plan approved by IDEM, and investigate and remediate the facility in accordance with plans approved by EPA. RMC conducted the required investigations and provided the results to EPA and IDEM.

EPA evaluated the investigation results and determined that RMC must take remedial action to protect human health and the environment. In the Final Decision issued on September 15, 2009, EPA required RMC to:

- Excavate contaminated media, including soils, sediment, and debris, demolish several remaining site structures, and consolidate the remediation waste into an on-site containment cell. Hazardous waste units undergoing closure pursuant to IDEM requirements would also be consolidated into the containment cell;
- Place an institutional control on the property to restrict land and groundwater use; and
- Conduct monitored natural attenuation to restore contaminated groundwater on the facility.

EPA required RMC to cover the containment cell with an impermeable geomembrane cap, and conduct a long-term operation, maintenance and monitoring program for the containment cell. RMC prepared a Corrective Measures Design to complete the work required by IDEM and EPA.

III. DESCRIPTION OF CHANGE TO THE SELECTED REMEDY

RMC began the final remedy and closure implementation in August, 2014. During excavation, RMC discovered more waste that required remediation. By December, 2014, RMC had consolidated approximately 21,000 cubic yards of remediation waste into the containment cell and reached the cell's maximum capacity. On June 16, 2015, RMC provided a Request for Amendment to Corrective Measures Design (Amendment) to EPA and IDEM to expand the containment cell to accommodate the additional remediation waste. RMC estimates that approximately 13,261 cubic yards of remediation waste remains to be excavated and consolidated into a containment cell.

The expansion proposed by the Amendment will extend approximately 120 feet to the south and is identified in the Amendment as Containment Cell B (CCB). This expansion is sufficient to contain the amount of remediation waste remaining. However, if the additional volume of CCB also proves insufficient, excess soils may be sent off-site for disposal in accordance with federal, state, and local regulations. RMC may treat excess soils with hazardous characteristics onsite using reagents to reduce the leachability of metals from soils. Any treatment will be performed in-situ prior to removal.

CCB will be constructed in the same manner as the original containment cell. Consistent with the original containment cell design, CCB will be covered with a non-woven geotextile placed on the soil surface, a textured 60 mil HDPE geomembrane, double sided drainage net, and 18 inches of compacted soil fill. The cap cover soil, topsoil, and turf will also remain the same as presented in the final Corrective Measures Design for the containment cell.

Table 1

Summary of Significant Change to the Final Remedy

Remedial Component	Original Remedy Design 2009	Significant Difference Remedy Changes 2015
Estimated volume of soil, sediment, and debris	Approximately 21,000 cubic yards	Approximately 34,000 cubic yards
Containment Cell Capacity	Approximately 22,000 cubic yards	Approximately 37,000 cubic yards

IV. STATUTORY DETERMINATIONS

EPA's approval of the containment cell expansion will provide RMC the additional capacity needed to complete the work originally required by IDEM and EPA. The remedy protects human health and the environment, and will comply with federal and state requirements that are applicable, and relevant and appropriate to this remedial action.

V. PUBLIC PARTICIPATION COMPLIANCE

This ESD and copies of other documents related to the corrective action program for RMC are available at:

- Beech Grove Public Library
  1102 Main Street
  Beech Grove, Indiana 46107

- U.S. EPA Region 5 Records Center
  77 West Jackson Boulevard
  Chicago, Illinois 60604

The significant change described in this ESD involves expanding the previously approved containment cell to accommodate additional remediation waste. The remediation waste is similar to that already consolidated within the existing containment cell. The expansion does not fundamentally alter the overall remedial design or objectives. Therefore, EPA has determined that a formal public comment period is not necessary. If you have any questions or concerns, please contact Ms. Tamara Ohl at (312) 886-0991, or via email at ohl.tamara@epa.gov.

ADMINISTRATIVE RECORD

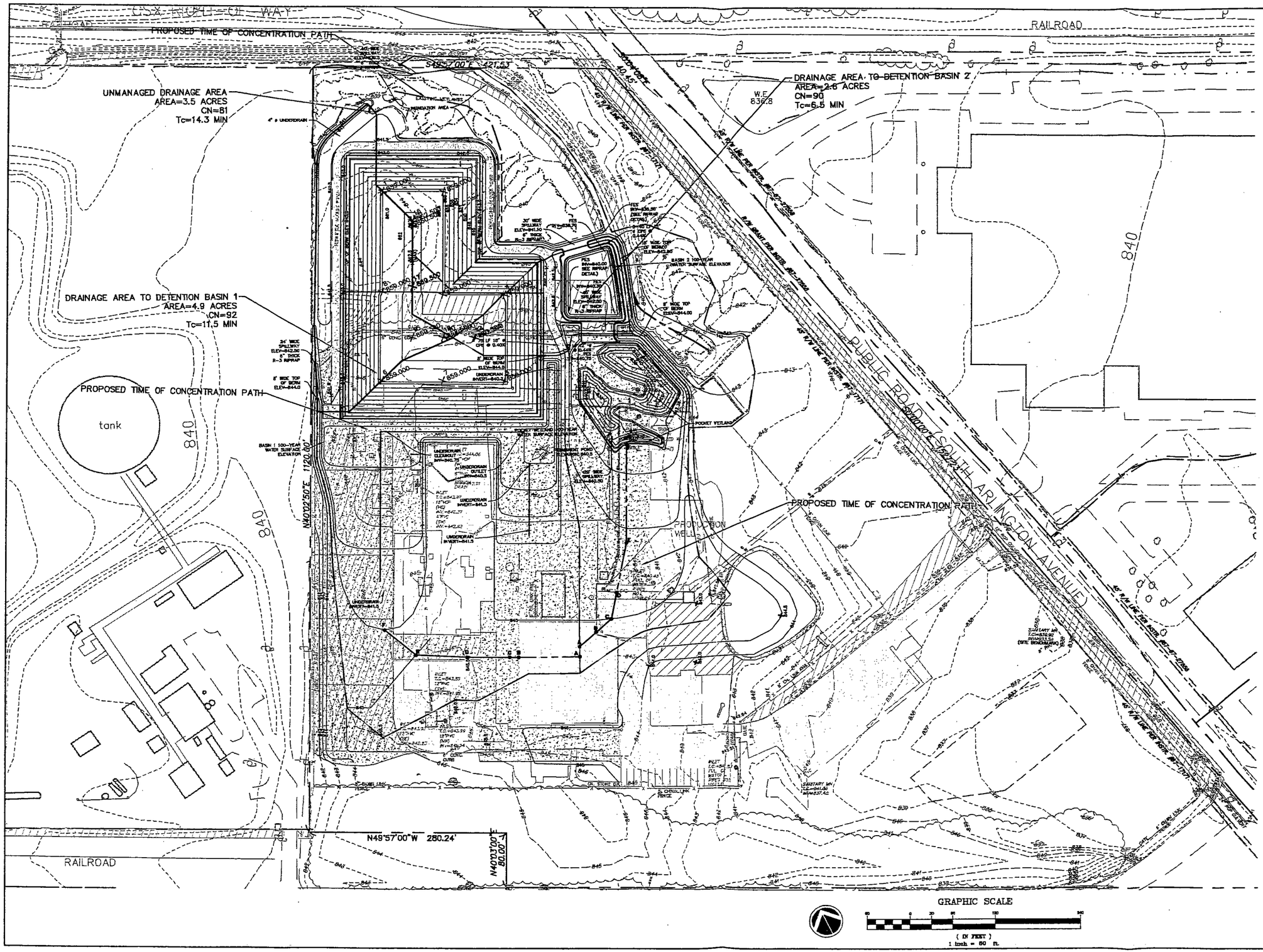
EXPLANATION OF SIGNIFICANT DIFFERENCE

Refined Metals Corporation

Beech Grove, Indiana

IND 000 718 130

Author	Date	Document
EPA/IDEM	August 31, 1998	Consent Decree pursuant to Section 3008(a) of RCRA
EPA	September 14, 2009	Final Decision and Response to Comments
RMC	September 6, 2013	Final Corrective Measures Design
RMC	June 16, 2015	Request for Amendment to Corrective Measures Design



DATE:	REVISION:
06-30-11	REV. PER 06-20-11 INDIANAPOLIS REVIEW LETTER
08-04-11	REV. TO FINAL
11-20-12	REVISE CAP LAYOUT
5-12-13	REVISE STORMWATER MANAGEMENT BMP'S
7-18-13	REV. PER 06-27-13 INDIANAPOLIS REVIEW LETTER
2-12-14	REV. PER 1-15-14 EPA REVIEW LETTER

LEGEND

- Proposed Time of Concentration
- Proposed Drainage Area
- Existing Contour
- Existing Building
- Former Building Footprint
- Existing Edge of Paving
- Existing Right of Way
- Existing Tree Line
- Existing Wetland Limit Line
- Existing Flood Plain Limit Line
- Existing Lot Line
- Property Line (Approximate)
- Existing Sanitary Sewer
- Existing Stormwater Line w/ Inlet
- Existing Water Line
- Existing Gas Line
- Existing Electric Line
- Existing Utility Pole
- Approximate Zoning Boundary
- Non-HW&U Excavation Area with Excavation Depth in Inches
- Proposed Security Fence
- MW-11 Monitoring Well
- CSB08 Approximate Soil Sample Location
- CSB28 Soil Sample Location/Designation Surveyed by the Schneider Corp., Indianapolis, Indiana
- RSB77 Soil Sample Location/Designation Surveyed by the Schneider Corp., Indianapolis, Indiana
- RSB05 Phase II RFI Soil Sampling
- RSED1R Sediment Sample Location S. Arlington Ave. Drainage Ditch
- RSB6 Sediment Sample Location S. Arlington Ave. Drainage Ditch
- RSB03 Sediment Sample Location in Grassy Area Swales
- Area to be Stabilized with 6" Thick Crushed Stone or Recycled Concrete
- Existing Impervious Surface to Remain

NOTES:

1. TOPOGRAPHIC SURVEY WITHIN REFINED METALS PROPERTY OBTAINED FROM FIELD SURVEY PERFORMED BY THE SCHNEIDER CORPORATION AUGUST, 2010. ORIGINATING BENCHMARK INDIANA DEPARTMENT OF TRANSPORTATION BRONZE DISC STAMPED "MAR C-354" ELEVATION 862.49 (NGVD 29).
2. TOPOGRAPHIC INFORMATION OUTSIDE OF REFINED METALS PROPERTY OBTAINED FROM IMAGIS CITY OF INDIANAPOLIS BASED ON NGVD 29.
3. BUILDINGS ON THE REFINED METALS PROPERTY HAVE BEEN DEMOLISHED, EXCEPT PUMP HOUSES #1 THROUGH #4.

ADVANCED GeoServices
Engineering for the Environment. Planning for People.™
1055 ANDREW DRIVE, SUITE A
WEST CHESTER, PENNSYLVANIA 19380

REFINED METALS CORPORATION
BEECH GROVE, INDIANA

STORWATER MANAGEMENT DESIGN & STORMWATER POLLUTION PREVENTION PLAN

PROPOSED CONDITIONS DRAINAGE AREA PLAN

DA-02

Scale:	1"=60'
Designed By:	J.W.D.
Drawn By:	P.S.G.
Checked By:	J.W.D.
Project Mgr.:	P.G.S.
Project No.:	2003-1046
Sheet No.:	2 OF 8
Issued:	

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
We Protect Hoosiers and Our Environment.
100 N. Senate Avenue • Indianapolis, IN 46204
(800) 451-6027 • (317) 232-8603 • www.idem.IN.gov
Michael R. Pence, *Governor*
Thomas W. Easterly, *Commissioner*

July 24, 2015

Indianapolis Star
Legal Notice Department
130 S. Meridian Street
Indianapolis, Indiana 46225

Dear Sir/Madam:

Re: Public Notice

Enclosed is a copy of a public notice of the U.S. Environmental Protection Agency's approval of a request to modify the Final Remedy selected by EPA for the Refined Metals Corporation, 3700 South Arlington Avenue, Beech Grove, Indiana. Please publish this notice, one time only, on August 4, 2015.

Please send a notarized form and clipping showing the date of publication and billing to Ms. Glynda Oakes, Indiana Department of Environmental Management, Office of Land Quality. If a separate invoice is sent, be sure to include the publication date on the invoice.

Your timely attention to this matter is appreciated. If you have any questions, please call Ms. Glynda Oakes at 233-1052 or Ms. Ruth Jean at 232-3398.

Sincerely,

Victor P. Windle

Victor P. Windle, Chief
Hazardous Waste Permit Section
Permits Branch
Office of Land Quality

RAJ/gjo

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY

PUBLIC NOTICE

DATE OF NOTICE: August 4, 2015

The U.S. Environmental Protection Agency (EPA) has received a request to modify the final remedy for:

Refined Metals Corporation
3700 S. Arlington Avenue
Beech Grove, Indiana
IND 000718130

EPA has reviewed the request and is modifying the final remedy to increase the capacity of the previously approved containment cell to allow consolidation of additional remediation waste found during cleanup. EPA's approval of the modification to the final remedy is discussed in the Explanation of Significant Difference. A copy of this document is available for your review at:

- Beech Grove Public Library at 1102 Main Street, Beech Grove, Indiana
- U.S. EPA Region 5 Records Center, 77 West Jackson Boulevard, Chicago, Illinois
- IDEM Virtual File Cabinet at: http://www.IN.gov/idem (VFC Document # 80060658).

EPA and IDEM are providing public notice of this action. If you have any questions about the Explanation of Significant Difference or public notice process, please contact Ms. Tamara Ohl of the EPA at (312) 886-0991 or at ohl.tamara@epa.gov.

PUBLISHER'S AFFIDAVIT

STATE OF INDIANA,
County Of Marion } **SS:**

Fee, $57.32

Personally appeared before me, a notary public in and for said county and state, the undersigned

I, being duly sworn, say that I am a clerk for **THE INDIANAPOLIS NEWSPAPERS** a **DAILY STAR** newspaper of general circulation printed and published in the English language in the city of **INDIANAPOLIS** in state and county aforesaid, and that the printed matter attached hereto is a true copy, which was duly published in said paper for 1 times., the dates of publication being as follows:

The insertion being on the 08/04/2015

Subscribed and sworn to before me this 4 day of August, 2015

Rose F Hinson

Notary Public

ROSE F HINSON
Boyle County
NOTARY PUBLIC
Comm. # 626734
NOTARY SEAL
My Commission Expires 05-25-2017
STATE OF INDIANA

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY

PUBLIC NOTICE

DATE OF NOTICE: August 4, 2015

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Refined Metals Corporation
3700 S. Arlington Avenue
Beech Grove, Indiana
IND 000718130

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- U.S. EPA Region 5 Records Center, 77 West Jackson Boulevard, Chicago, Illinois
- IDEM Virtual File Cabinet at: http://www.IN.gov/idem (VFC Document # 80060658).

EPA and IDEM are providing public notice of this action. If you have any questions about the Explanation of Significant Difference or public notice process, please contact Ms. Tamara Ohl of the EPA at (312) 886-0991 or at ohl.tamara@epa.gov.

(S - 8/4/15 - 0000616954)

Form Prescribed by State Board of Accounts
(Rev. 2002)

General Form No. 99P

_____
(Governmental Unit)

To: **Indianapolis Star**

_____ County, Indiana_____

Indianapolis, IN

PUBLISHER'S CLAIM

COMPUTATION OF CHARGES

Acct #:INI-10900
Ad #: 0000616954

36 lines, 2 columns wide equals 72 equivalent lines at $0.80 per line @ 1 days,	$57.32
Website Publication	$0
Charge for proof(s) of publication	$0.00
TOTAL AMOUNT OF CLAIM	$57.32

DATA FOR COMPUTING COST

Width of single column 9.5 ems
Number of insertions 1
Size of type 7 point

Pursuant to the provisions and penalties of Ch. 155, Acts 1953,
I hereby certify that the foregoing account is just and correct, that the amount claimed is legally due, after allowing all just credits, and that no part of the same has been paid.

Lucie M. Chapman

Date: Aug 5, 2015 Title: **Clerk**

Claim No. _____ Warrant No. _____

IN FAVOR OF

The Indianapolis Star

Indianapolis, IN

Marion County

130 S. Meridian St. Indianapolis, IN 46225

$ _____

On Account of Appropriation For

_____

FED. ID

#13-2599556

Allowed _____, 20____

In the sum of $_____

_____

_____

_____

I certify that the within claim is true and correct; that the services there-in itemized and for which charge is made were ordered by me and were necessary to the public business.

_____

_____

_____, 20____

I have examined the within claim and hereby certify as follows:

That it is in proper form.

This it is duly authenticated as required by law.

That it is based upon statutory authority.

That it is apparently (correct) ~~(incorrect)~~

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
We Protect Hoosiers and Our Environment.
100 N. Senate Avenue • Indianapolis, IN 46204
(800) 451-6027 • (317) 232-8603 • www.idem.IN.gov

Michael R. Pence
Governor

Thomas W. Easterly
Commissioner

July 24, 2015

Beech Grove Public Library
1102 Main Street
Beech Grove, Indiana 46107-1522

Dear Sir/Madam:

Re: Refined Metals Corporation
Request to Modify Final Remedy
Public Participation

Under the Resource Conservation and Recovery Act (RCRA), all permitted and interim status hazardous waste treatment, storage, or disposal facilities are required to conduct corrective action for any releases of hazardous wastes or hazardous constituents at or from their facilities. The U.S. Environmental Protection Agency (EPA) has received a request to modify the corrective action final remedy for Refined Metals Corporation in Beech Grove, Indiana.

EPA and IDEM are providing the public an opportunity to submit comments on the request to modify the final remedy. Enclosed is a copy. Please make available for public examination this letter and the enclosed information for a period of 60 days.

If you have any questions regarding this matter, please call Ms. Tamara Ohl of the EPA at (312) 886-0991 or ohl.tamara@epa.gov.

Sincerely,

Victor P. Windle, Chief
Hazardous Waste Permit Section
Permits Branch
Office of Land Quality

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

MEMORANDUM

SUBJECT: Explanation of Significant Differences
Refined Metals Corporation, Beech Grove, IN

FROM: Jose Cisneros, Chief
Remediation and Reuse Branch

TO: Margaret M. Guerriero, Director
Land and Chemicals Division

Attached for your signature is an approval for a significant change to EPA's Final Decision made on September 15, 1999.

The Refined Metals Corporation (RMC) was a secondary lead smelter, receiving lead acid automotive and industrial batteries, and lead-bearing materials which it then processed to reclaim the lead. On August 31, 1998, RMC entered into a Consent Decree (CD) with EPA and the Indiana Department of Environmental Management pursuant to Section 3008(a) of RCRA. The CD required RMC to close waste piles and a surface impoundment pursuant to a closure plan approved by IDEM, and conduct a corrective action program.

EPA issued its Final Decision on September 15, 2009, requiring RMC to consolidate remediation waste into an on-site containment cell. In the course of remedy implementation, RMC found additional remediation waste in amounts which exceed the capacity of the containment cell originally constructed. On June 16, 2015, RMC requested to expand the containment cell 120 feet to hold the additional 13,261 cubic yards of remediation waste. The expansion will be constructed in the same manner as the containment cell.

EPA's approval of the containment cell expansion will provide RMC the additional capacity needed to complete the work required by IDEM and EPA. The remedy protects human health and the environment, and will comply with federal and state requirements that are applicable, and relevant and appropriate. I recommend that you sign the attached Explanation of Significant Differences.

Attachment

LAND AND CHEMICALS DIVISION

Type of Document: Explanation of Significant Difference
RR

Name of Document: Refined Metals Corporation
Beech Grove, IN

	NAMES	DATE
AUTHOR:	T. Ohl	6-25-2015
APA:	Angela Jackson	7 6/29/15
SECTION CHIEF:	Tammy Moore	6/30/15
BRANCH CHIEF:	José Cisneros	7/14/15
DIVISION APA:		
DIVISION DIRECTOR:	M. Guerriero	7/20/15
OTHERS:	ORC	7/7/15
	GWP	7/8/15 CLP
DRA:		
RA:		

RETURN TO:

PHONE:

COMMENTS:

Refined Metals Corporation

VIA EMAIL & U.S. MAIL

November 6, 2009

Mr. Jonathan Adenuga
U.S. Environmental Protection Agency
77 West Jackson Boulevard, DRE-9J
Chicago, IL 60604

Ms. Ruth Jean, Project Manager
Indiana Department of Environmental Management
100 North Senate Street
MC66-20 IGCN 1101
Indianapolis, IN 46204-2251

Re: Remedial Design Deliverables and Schedule
Refined Metals Corporation
Beech Grove, Indiana
EPA ID No. IND000718130

Dear Jonathan and Ruth,

This letter confirms our discussion yesterday regarding next steps for the Remedial Design. As we discussed, the first Remedial Design deliverable that Refined Metals will submit is a document that provides more detail than the Corrective Measures Implementation Program Plan as defined in the Consent Decree, but probably somewhat less than the Preliminary (30%) Design as defined in the Consent Decree. Although the first deliverable may not fulfill all of the requirements for a Preliminary Design as defined in the Consent Decree, Refined Metals will refer to this first deliverable as the Preliminary Design. This first deliverable will be submitted in lieu of CMIPP and the Preliminary Design as defined in the Consent Decree.

The Preliminary Design will be submitted to EPA and IDEM (collectively, the Agencies) by January 8, 2010. After submittal to the Agencies, the Agencies will contact Refined Metals when the Agencies have completed their review and are ready to meet and discuss the Preliminary Design. At that point, a meeting in Indianapolis will be scheduled to discuss the Preliminary Design.

Please contact me if I have in any way misrepresented our discussions yesterday.

Sincerely,

REFINED METALS CORPORATION

Matthew A. Love

cc: Paul Stratman – AGC
Mark Bonifas – Hull
Doug Stewart - Hull

Refined Metals Corporation

VIA EMAIL & U.S. MAIL

October 29, 2009

Mr. Jonathan Adenuga
U.S. Environmental Protection Agency
77 West Jackson Boulevard, DE-9J
Chicago, IL 60604

Re: Receipt Date of Final Decision and Response to Comment Document
Refined Metals Corporation
3700 South Arlington Avenue; Beech Grove, Indiana
EPA ID No. IND000718130

Dear Jonathan,

This letter confirms our conversation today regarding the date on which Refined Metals received the Final Decision and Response to Comment document issued by the EPA on September 15, 2009. As we discussed today and on one previous occasion, the document was not mailed to Refined Metals by the EPA until October 15, 2009 due to an administrative oversight. Both you and I agreed that the date of receipt by Refined Metals will be October 21, 2009. Please contact me if I have in any way misrepresented our conversation.

Sincerely,

REFINED METALS CORPORATION

Matthew A. Love

cc: Ruth Jean - IDEM

September 15, 2009

EPA

BRIEFING

Final Decision and Response to comments for Selection of remedial Alternative for Refined Metals Corporation, Beech Grove, Indiana.

BACKGROUND INFORMATION

Refined Metals Corporation is located at 3700 South Arlington Avenue in Marion County, Beech Grove, Indiana, approximately four miles south-southeast of downtown Indianapolis. In 1968, the property was developed as a secondary lead smelter by National Lead. National Lead operated the facility from 1968 through 1980, when it was sold to Exide Corporation. In 1985, the site was purchased from Exide Corporation by RMC. RMC continued to operate the facility until the cessation of operations on December 31, 1995. From April 14, 1995 through December 31, 1995, operations were reduced to enriching and casting lead ingots from off-specification lead products. Since 1996, no operations have taken place at the facility. Soil and groundwater in several areas at the facility are contaminated at levels above appropriately protective risk-based screening thresholds. Offsite contamination has also been reported north of the facility and in a drainage ditch east of the facility and at the adjacent Citizen's Gas Property west of the facility.

Remedial Alternative Selected

Following the conclusion of the facility investigations, a Statement of Basis was issued for public review and comment from June 27, 2008 to August 11, 2008. The Proposed remedies consisted of excavation of highly contaminated soils and sediments, incorporation of the excavated soils and sediments in an onsite Containment Cell, placement of institutional control on the facility and monitored natural attenuation. We received a number of written comments from the Citizens Gas Energy Group and the City of Beech Grove, Indiana. We have prepared responses to all these concerns and comments. In sum, one substantive change to the Statement of Basis was made. The proposed remedy was modified to address concerns regarding the location of the proposed Containment Cell. The attached Final Decision and Response to Comments describes in detail received comments, our responses and the selected remedy for the Refined Metals Corporation facility.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V
77 W. Jackson Blvd.
Chicago, IL 60604

Land and Chemicals Division

Correspondence for Land and Chemical Division Director's Signature

Subject: Final Decision and Response to Comments for the RMC facility located in Beech Grove, Indiana EPA ID No. IND 000 718 130

TO:	Initials	Date
1. *Jonathan Adenuga, Author, RRB, CAS2:*	JOA	8/11/09
2. *Angela Jackson, Assistant, CAS2:*	AJ	8/11/09
3. *George Hamper, Chief, CAS2:*	GH	8/11/09
4. *monesh Chabria, ORC:* CMJ	MC	9/3/09
5. C. Pachalski, *Chief, ORC*	CLP	9/3/09
6. *Jose G. Cisneros, Chief, RRB*	JC	9/8/09
7. *Margaret M. Guerriero, Director, LCD*	MG	9/17/09

Comments:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
FINAL DECISION AND RESPONSE TO COMMENTS
FOR SELECTION OF REMEDIAL ALTERNATIVE

FOR
REFINED METALS CORPORATION FACILITY
BEECH GROVE, INDIANA

September, 2009

FINAL DECISION AND RESPONSE TO COMMENTS
SELECTION OF FINAL REMEDIAL ALTERNATIVE
FOR
Refined Metals Corporation Facility
Beech Grove, Indiana

Introduction

This Final Decision and Response to Comments (FD/RC) is presented by the Environmental Protection Agency (EPA) for the Refined Metals Corporation (RMC) Facility located in Beech Grove, Indiana. The FD/RC includes, as Attachment I, the previously issued Statement of Basis. The Statement of Basis outlined potential remedial alternatives at the Facility as well as EPA's proposed remedy and was made available for public review and comment from June 27, 2008 to August 11, 2008. This FD/RC selects the final remedy to be implemented at the Refined Metals Corporation Facility based on the Administrative Record and public comments. EPA's Response to Comments addresses substantive comments received on the Statement of Basis during the 45 day public comment period.

Assessment of the Site

The response action documented in this FD/RC is necessary to protect human health and the environment.

Selected Remedy

EPA has selected the following remedial components as the remedy to address contaminated soil, groundwater and sediment at the Refined Metals Corporation Facility:

For lead in onsite soils and sediments, as well as offsite soils along the Arlington Avenue right-of-way, the railroad right-of-way, and the Big Four Road right-of-way, RMC will implement the following tasks as described in the Statement of Basis:

- Excavation of the most highly contaminated soils and sediments,
- Demolition of the Material Storage Building, Battery Breaker Building, Filter Press Building, Waste Water Treatment Building and Surface Impoundment, and
- Placement of institutional controls to restrict the use of the property to only commercial/industrial land use.

To assure safe and effective long-term management of the excavated soils and sediments as well as debris and rubble generated from the excavation and demolition, RMC will implement the following tasks as described in the Statement of Basis, except that the location of the Containment Cell has been changed:

- Construction of a Containment Cell that will be located in the northwest portion of the RMC property, north of the former operational area and parking areas, and west of the drainage ditch,
- Placement of excavated soils and sediments, as well as the debris and rubble from the building demolition in an onsite Containment Cell,
- Encapsulation of the excavated soils and sediments beneath an impermeable geomembrane cap covering the entire footprint of the Containment Cell and a vegetative cover above the geomembrane,
- Establishment of long-term operation, maintenance and groundwater monitoring of the Containment Cell including existing monitoring wells, and
- Placement of institutional controls on the Containment Cell to prevent any disturbance, excavation, or other activity that might result in a release of any materials contained in the cell.

To manage any excavated soils and sediments as well as any demolition debris or rubble that is not safely managed in the onsite containment cell, RMC will implement the following task:

- Shipment of these materials offsite to another facility for recycling or disposal in accordance with all applicable Federal, State and local regulations.

For Lead in soils at the offsite Citizens Gas property: The commercial/industrial cleanup standards are applicable to this property, and EPA agrees that no remediation is warranted provided that the future land use is restricted to commercial/industrial. Thus, the selection of this final remedy requires implementation of a deed restriction on the Citizens Gas property to ensure that its use is restricted to only commercial/industrial. Citizens Gas and RMC have reached an agreement regarding the land use restriction and the majority of comments raised by Citizens Gas on EPA's draft statement of basis have been rendered moot. Some construction work will be performed under this agreement between RMC and Citizens Gas, but independent of this final remedy.

For On-site Groundwater: To prevent human consumption of groundwater at the Facility, RMC will place a deed restriction preventing the installation of potable groundwater wells at the Facility. Institutional controls are also necessary to prohibit the use of shallow on-site groundwater as a drinking water source and restrict construction activities in on-site areas where humans may come in direct contact with shallow groundwater. In addition, Monitored Natural Attenuation (MNA) will be implemented as the principal means of restoring the on-site contaminated groundwater at the Facility. Monitored natural attenuation (MNA) is the stabilization and long-term shrinking of a contaminant plume by natural processes such as microbial degradation. The major component of MNA as a remedial alternative would be the long-term monitoring program to provide initial and continuing confirmation that the predicted

biological activity and/or reductions in contaminant concentrations occur and remain effective. Monitored Natural Attenuation must demonstrate reduction or stabilization of lead within 10 years of this Final Decision. Within this reasonable time frame (10 years), we expect that monitored natural attenuation will restore the on-site groundwater such that it would be available for use as a source of commercial or residential drinking water.

Documents to be submitted:
RMC shall submit to EPA for review and approval within 60 days of this Final Decision a Corrective Measures Implementation (CMI) workplan for the excavation and off-site treatment/disposal, the building demolition, and the construction of the Containment Cell for lead contaminated soils and sediments. The design work consists of the design plans and specifications, proposed remediation objectives, construction cost estimate, construction quality assurance objectives, waste disposal requirements, project schedule, quality assurance project plan, Community Relations Plan, sampling and analysis plan, an air deposition management plan and health and safety plan. RMC shall implement the approved final design, incorporating EPA comments. Remedy construction must be completed within one year of this Final Decision, and a Construction Completion Report and O&M Plan must be submitted to EPA for review and approval at that time. In the report, a registered professional engineer and the RMC Project Manager shall certify that the remedy for lead-contaminated soils and sediments from these areas have been conducted in accordance with the EPA-approved final design and specifications, to the best of their knowledge, and cleanup objectives have been attained. The report shall include as-built drawings signed and stamped by a registered professional engineer. RMC must implement any approved final O&M Plan, incorporating EPA comments.

The operation and termination of the MNA remedy must also be described in the CMI workplan to be submitted by RMC for approval by EPA. In the CMI workplan, RMC will propose for EPA approval the criteria for measuring satisfactory progress. Every 2 years after the workplan approval, RMC must submit a report assessing whether MNA is progressing satisfactorily. If after 10 years the comprehensive groundwater monitoring program does not demonstrate that MNA is performing as expected, then RMC must propose an alternate remedy for EPA approval, and then implement the approved alternate remedy to achieve the corrective action objectives for the groundwater remediation.

Other Certification, Monitoring, Reporting, Institutional Control, and Financial Assurance Requirements.

As part of the Corrective Action, RMC will:

- Provide certification by a responsible corporate officer or duly authorized representative of all documents submitted pursuant to this Final Decision, as required in the Consent Decree entered in this matter.
- Implement institutional controls for the land, soil, and groundwater portions of the RMC Facility that are the subject of this Final Decision. The institutional controls shall ensure

that RMC property use remains industrial/commercial; the soil and onsite Containment Cell at the facility are not disturbed in a manner that poses a risk to workers or interferes with the implementation of the final remedy; groundwater monitoring wells are maintained until the MNA criteria approved in the CMI workplan are achieved; and the wells are approved for abandonment by EPA.

- Within 30 days of receipt of this Final Decision, provide detailed estimate of capital costs for implementing the final remedy.

- Obtain financial assurance for completion of the final remedy, including operation and maintenance (O&M), within 90 days of the Final Decision.

- Submit CMI monthly progress reports to EPA during the design and construction phases detailing work performed to date, data collected, problems encountered, project schedule, and percent project completed. Progress reports are due by the 15th day of each month following the Final Decision. Submit CMI progress reports semiannually for O&M activities upon approval of the Construction Completion Report.

The final remedy selected by EPA meets the threshold criteria that reflect the performance standards that must be achieved, including:

- Protect Human Health and the Environment
- Attain Media Cleanup Standards Set by EPA
- Control the Sources of Releases
- Comply with Any Applicable Standards for Management of Wastes

The final remedy also considers balancing criteria that represent a combination of technical measures and management controls that helped identify the best remedy, including:

- Long-term Reliability and Effectiveness
- Short-term Effectiveness
- Reduction in the Toxicity, Mobility, or Volume of Wastes
- Implementability
- Cost

Public Participation and Comments

A forty-five (45) day public comment period was held from June 27, to August 11, 2008. Comments were received from Citizens Gas and the City of Beech Grove, Indiana during the public comment period.

Public Comments and EPA's Response to Comments

Comments received on the proposed remedy from the Citizens Gas/Citizens Energy Group and

City of Beech Grove were considered and addressed in the final remedy. As a result, the proposed remedy was modified by EPA to address concerns regarding whether the location of the Containment Cell for consolidation of remediation wastes ensured proper storm water management and potential future development of the RMC facility.

The following narrative summarizes written comments on the proposed remedy and EPA's response to each comment. Each comment is numbered and presented in italicized type. Citizens Gas, a neighboring property owner, raised a number of issues regarding the Statement of Basis in a September 9, 2008, letter. After reaching an agreement with Refined Metals Corporation, Citizens Gas withdrew all of its comments except the following:

1. Citizens Gas requested that the containment cell be located in the northwest portion of the Refined Metals Property, north of the former operational and parking areas and west of the drainage ditch.

Response: EPA agrees that the proposed location of the containment cell could have had some adverse impacts on Citizens' property. The original location was proposed based upon EPA guidance which suggested that it is appropriate to manage waste in its place rather than transfer it to another location. However, the policy allows, under certain conditions, hazardous wastes may be moved within such areas without triggering RCRA land disposal restrictions. Since the location proposed by Citizens Gas is not an uncontaminated area requiring further analysis and approval, the containment cell will be relocated.

2. Citizens Gas requested that Refined Metals be required to develop a storm water management plan both during and following construction of the corrective measures to prevent contaminated storm water from migrating onto Citizens Gas property.

Response: The relocation of the containment cell, as described above, and proper engineering design, should alleviate runoff from the Refined Metals property. The final design plan will be submitted to EPA for approval and the design will be properly engineered and aesthetically acceptable.

3. Citizens Gas requested that Refined Metals be required to develop an air deposition management plan that will prevent contaminants from becoming airborne during Refined Metals' implementation of its corrective measures.

Response: EPA agrees that airborne particulate matter generated during the excavation process should be addressed. EPA will require that RMC include a plan to prevent airborne particulate matter in its Corrective Measures Implementation (CMI) Plan.

City of Beech Grove Comments

The City of Beech Grove provided comments which focused on the future development potential of the property, specifically that the design, location, and timing of the action and the involvement of the City are critical. The following comments were raised:

1. The City requested that the following be considered in the decision regarding the containment cell:

a. *Minimizing the volume of the contaminated media contained onsite (and thus the size of the cell) to the extent possible considering that off-site disposal is a viable option;*

b. *Locating the containment cell in a manner that maximizes the acreage for development purposes, particularly indicating that locating along the boundary of Citizens Gas facility would be good from future reuse options;*

c. *Sizing the containment cell in a manner that does not detract from the visual aesthetics of the site for potential future redevelopment (balancing vertical and horizontal dimensions); and*

d. *Establishing a perimeter, access points, and access control for the containment cell to not limit future redevelopment.*

Response: As described above, EPA has agreed to relocate the containment cell to the northwest corner of the RMC property. The Containment Cell will not be any larger than necessary, and the design will be properly engineered and aesthetically acceptable. These issues will be addressed in the CMI workplan to be submitted to EPA for approval.

2. The City requested that EPA expedite the Workplan process so that implementation of the corrective measures can commence.

Response: EPA will work as expeditiously as possible to review and approve the Workplan for implementation of the Final Remedy. The Consent Decree related to this matter requires Refined Metals to submit to EPA for approval a Corrective Measures Implementation Program Plan within 60 days of receiving notification of the selected corrective measures.

3. The City requested that it be designated as a corresponding party in the Workplan development process and implementation of corrective measures activities, and that a standard and a process for ongoing communication with the City be incorporated into the Workplan.

Response: EPA has an entered Consent Decree with Refined Metals that outlines the requirements for communication regarding the development of plans and implementation of measures. EPA will keep the City informed about the process of implementing the Final Decision. EPA can share publicly available documents including workplans, reports, and correspondence. As part of the Corrective Measures, Refined Metals will prepare and implement

a Community Relations Plan (CRP). The CRP will designate a public repository for information regarding the site.

Future Actions

On August 31, 1998, the United States District Court for the Southern District of Indiana entered a Consent Decree in the matter of U.S. v. Refined Metals Corporation. The Consent Decree requires RMC to implement this Final Decision. The Consent Decree also requires RMC to provide financial assurance for the corrective action work. The future actions, beginning with submission of the CMI Work Plan, will begin as described earlier in this Final Decision.

Corrective Action Complete Determination

Once RMC believes it has met its corrective measures obligations, it may send a request to EPA Regional office for consideration for a Corrective Action Complete Determination (CACD). This request should include a written explanation justifying how RMC has satisfied the criteria for the CACD, based on the information outlined in the February 23, 2005 EPA guidance on CACD.

Administrative Record

The Administrative Record upon which the final remedy was selected is available at the Beech Grove Public Library, 1102 Main Street, Beech Grove, Indiana and the 7th Floor Records Center at EPA Region 5, 77 W. Jackson Blvd., Chicago, IL.

Declaration

Based on the Administrative Record compiled for this corrective action, EPA has determined that the selected remedy selected for the RMC Facility is appropriate and is protective of human health and the environment.

Date September 17, 2009

Margaret Guerriero Director
Land and Chemicals Division
U.S. Environmental Protection Agency
Region 5

Attachments

STATEMENT OF BASIS
For
Refined Metals Corporation
IND 000 718 130
Beech Grove, Indiana

Refined Metals Corporation
Beech Grove, Indiana

JUN 2 7 2008

INTRODUCTION

This Statement of Basis (SB) for the Refined Metals Corporation (RMC) facility in Beech Grove, Indiana, explains the proposed remedy for the collection, treatment, and removal of hazardous waste from the facility, the adjacent Citizens Gas Coke Company west of the facility, and the drainage ditch north of the facility. In addition, the SB includes summaries of all corrective measure alternatives analyzed by RMC. U.S. EPA will select a final remedy for the facility only after the public comment period has ended and the information provided by the public during this period has been reviewed and substantive comments considered.

U.S. EPA is issuing this SB as part of its public participation responsibilities under the Resource Conservation and Recovery Act (RCRA) and consistent with the August 31, 1998, Consent Decree entered in the matter of United States v. Refined Metals Corporation, U.S. District Court for the Southern District of Indiana, Civil Action No. IP902077C, (Consent Decree). This document summarizes information that can be found in greater detail in the March 29, 2000, Phase I and November 18, 2002 Phase II RFI reports and August 6, 2007 CMS Report and other pertinent documents contained in the Administrative Record for this facility. U.S. EPA encourages the public to review these documents in order to gain a more comprehensive understanding of the facility and the RCRA activities that have been conducted. The public can be involved in the remedy selection process by reviewing the documents contained in the Administrative Record.

U.S. EPA may modify the proposed remedy or select another remedy based on new information or public comments. Therefore, the public is encouraged to review and comment on **all** alternatives.

After U.S. EPA selects the remedy for this facility, RMC is required under the Consent Decree to implement the remedy beginning with the submission of an implementation plan to U.S. EPA.

PROPOSED REMEDY

SOIL AND SEDIMENTS

Alternative 2. Alternative 2 should be implemented to address lead in onsite soils and sediments, offsite soils along the Arlington Avenue right-of-way, the railroad right-of-way, and the Big Four Road right-of-way. Alternative 2 includes:

- Excavation of the most highly contaminated soils and sediments,
- Demolition of the Material Storage Building, Battery Breaker Building, Filter Press Building, Waste Water Treatment Building and Surface Impoundment, and
- Placement of institutional controls to restrict the use of the property to only commercial/industrial land use.

Alternative 3A. Alternative 3A should be implemented to assure safe and effective long-term management of the excavated soils and sediments as well as debris and rubble generated by Alternative 2. Alternative 3A includes:

- Placement of excavated soils and sediments, as well as the debris and rubble from the building demolition in an onsite Containment Cell,
- Encapsulation of the excavated soils and sediments beneath an impermeable geomembrane cap covering the entire footprint of the Containment Cell and a vegetative cover above the geomembrane,
- Establishment of long-term operation, maintenance and groundwater monitoring of the Containment Cell including existing monitoring wells and
- Placement of institutional controls on the Containment Cell to prevent any disturbance, excavation or other activity that might result in a release of any materials contained in the cell.

Alternative 4. Alternative 4 should be implemented to manage any excavated soils and sediments as well as any demolition debris or ruble that are not safely managed in the onsite containment cell. Alternative 4 includes:

- Shipment of these materials offsite to another facility for recycling or disposal in accordance with all applicable Federal, State and local regulations.

GROUNDWATER

Alternative 2. Alternative 2 should be implemented to prevent human consumption of groundwater at the facility. Alternative 2 includes the placement of a deed restriction preventing the installation of potable groundwater wells at the facility.

Alternative 4 - Monitored Natural Attenuation (MNA). Monitored Natural Attenuation (MNA) is the stabilization and long-term shrinking of a contaminant plume by natural processes such as microbial degradation. A Groundwater Performance Monitoring program should be implemented to assure safe and effective management of contaminated groundwater. The MNA appropriateness must be demonstrated through the performance monitoring program to show that the contaminant plume has been or can be effectively stabilized

FINANCIAL ASSURANCE

Any remedy selected by U.S. EPA will require that RMC must demonstrate that adequate funds will be available to complete the construction as well as the operation and maintenance of the proposed remedy. Under the Consent Decree, RMC must provide this financial assurance within 90 days after it receives U.S. EPA's selected remedy decision.

FACILITY BACKGROUND

The RMC facility is located at 3700 South Arlington Avenue in Marion County, Beech Grove, Indiana, approximately four miles south-southeast of downtown Indianapolis (Figure 3-2). The site occupies approximately 24 acres, of which approximately 10 acres represented the active manufacturing area (including paved areas and buildings). The remaining 14 acres includes grassed and wooded site areas. The configuration of the site is triangular, bounded by Arlington Avenue (oriented in a north to south direction representing the hypotenuse), Big Four Road (along the base), and the common property line with a natural gas company forming the third side. The northwest end of the triangle is truncated by a railroad right-of-way (Figure 3-1).

The site is relatively flat with less than 10 feet of total relief. Natural site drainage is toward the north and east. The former manufacturing area is characterized by nearly 80,000 square feet of structures consisting of the battery breaker, a wastewater treatment plant, a filter press, material storage areas, a blast furnace, a dust furnace, a metal refining area, a warehouse and offices. In addition, there are four baghouses, a vehicle maintenance structure, and five stormwater pump houses. The site plan is illustrated in Figure 2-2.

The ground surface surrounding the buildings is currently paved (primarily with concrete). Older facility photographs indicate that areas northwest and northeast of the main facility structure were unpaved except for a concrete driveway, which encircled the facility. The paved surface areas are sloped to drain toward catch basins situated around the site. The catch basins in-turn flow to the storm water pump houses that convey collected storm water either directly to the wastewater treatment plant for immediate processing (small storm events) or to a 750,000 gallon storm water and fire control lagoon where it is stored until it can be processed (large storm events). The lagoon was originally lined with concrete. During 1988, the lagoon was cleaned out and the concrete was covered with a geomembrane liner.

The site was reportedly undeveloped woodlands until 1968. In 1968, the property was developed as a secondary lead smelter by National Lead. National Lead operated the facility from 1968 through 1980, when it was sold to Exide Corporation. In 1985, the site was purchased from Exide Corporation by RMC. RMC continued to operate the facility until the cessation of operations on December 31, 1995. From April 14, 1995 through December 31, 1995, operations were reduced to enriching and casting lead ingots from off-specification lead products. Since

1996, no operations have taken place at the facility except for operation of the wastewater treatment facility, which is still used to treat stormwater runoff from the former manufacturing areas. Soil and groundwater in several areas at the facility are contaminated at levels above appropriately protective risk-based screening thresholds. Offsite contamination has also been reported north of the facility and in a drainage ditch east of the facility and at the Citizen's Gas Property west of the facility.

Samples of soil, sediments and groundwater were analyzed for other metals, but only lead and arsenic concentrations exceeded risk-based threshold criteria. Therefore, lead and arsenic were identified as contaminants of interest at the RMC facility.

CORRECTIVE MEASURES ALREADY IMPLEMENTED

To address the potential for lead containing sediments to be eroded from the drainage ditch along the railroad tracks at the north end of the site and subsequently transported offsite, RMC implemented an interim measure consisting of four check dams and silt fence. Each check dam consists of stone and geotextile placed across the existing ditch and perpendicular to flow direction. The silt fence was installed parallel to the check dams. The implementation of the interim measure will provide a means of intercepting, detaining and controlling runoff which ultimately should prevent sediment from leaving the facility.

SUMMARY OF FACILITY RISKS

Risks from exposure to lead and arsenic are unacceptable for construction workers/ redevelopment workers in the main manufacturing area of the facility, and for construction workers/redevelopment workers, groundskeepers, future industrial workers, and for trespassers exposed to soils and sediments in the grassy area of the facility.

Soil and groundwater in several areas at the facility are contaminated at levels above appropriately protective risk-based screening thresholds. In addition, the adjacent Citizen's Gas property and several offsite right-of-ways are contaminated above appropriate protective risk-based screening thresholds. The risk-based screening thresholds used for this determination are 1300 mg/kg of lead in industrial areas, and 400 mg/kg of lead for soil in unrestricted areas. A screening level of 20 mg/kg was used for arsenic in industrial soils, and 3.9 mg/kg in soils in unrestricted areas. The screening thresholds are 42 mg/l of lead and 10 mg/l of arsenic for groundwater.

On-Site Soils in the Former Manufacturing Area

Concentrations of lead in the top thirty inches of soil ranged from 4.7 mg/kg to 475,000 mg/kg. Concentrations of arsenic ranged from 3.9 mg/kg to 1111 mg/kg at this depth.

On-Site Soils and Sediments in the Grassy Area

The soil and sediment samples collected within the lined lagoon, the drainage ditch adjacent to the lined lagoon, the intermittent stream northeast of the site, and the other areas collectively known as the grassy area show high lead concentrations. Concentration of lead collected within the 30 inches interval ranged from 11 mg/kg to 243,000 mg/kg. Concentrations of arsenic ranged from 3.9 mg/kg to 2,300 mg/kg.

Off-Site Soils

Soils were sampled on the adjacent properties to the north of the facility (the Arlington Avenue right-of-way, the railroad right-of-way, and the Big Four Road right-of-way) for lead and arsenic characterization. Lead concentrations in the 0-10 inch interval ranged from 13 mg/kg to 8430 mg/kg. Arsenic concentrations in this interval ranged from 9.4 mg/kg to 169 mg/kg.

Offsite Citizen's Gas Property Soils

Concentrations of lead in soil samples collected from this property averaged 1311 mg/kg. Concentrations of arsenic averaged 28.5 mg/kg.

Groundwater

Shallow groundwater sample results, obtained as part of the RFI activities, show that the current Maximum Contaminant Level (MCL) for arsenic (10 ug/L) has been exceeded on more than one occasion at groundwater monitoring wells MW-1, MW-2, MW-3, MW-7 and MW-8. The 15 ug/L MCL standard for lead was exceeded on more than one occasion in MW-2, MW-7 and MW-8.

MEDIA CLEANUP STANDARDS

The goals of the proposed remedy are to eliminate significant exposures that pose threats to human health and the environment, to clean up contaminated soils to levels consistent with current land use, to restore groundwater to its maximum beneficial use, and to eliminate risks to human health by meeting the applicable health-based groundwater protection standards. U.S. EPA considers corrective action for groundwater to be complete at this facility when all releases to groundwater, including releases from SWMUs, have been remediated. Groundwater cleanup objectives include three components: groundwater cleanup levels, point of compliance, and remediation time frames. Point of compliance for corrective action should be throughout the area where groundwater is contaminated above cleanup levels, or, when waste is left in place, at and beyond the boundary of the waste. U.S. EPA refers to this point of compliance as the "throughout-the plume/unit boundary" point of compliance.

RMC's soil and groundwater sampling reports identified total concentrations of lead and arsenic in soil that were above the U. S. EPA's risk based screening thresholds and therefore potentially pose an unacceptable risk to human health. Accordingly, RMC submitted a site specific Baseline Human Health Risk Assessment (BHHRA). The BHHRA evaluated multiple lead and arsenic exposure scenarios for the former manufacturing areas as well as the surrounding areas of the site covered by lawn, brush and woods ("grassy areas"). The BHHRA concluded that under some of the exposure scenarios, an unacceptable risk may exist for lead.

The BHHRA calculated proposed Media Clean-up Standards (MCSs), which are the average allowable concentrations for each contaminant in each area where contamination presented an unacceptable risk. The Remedial Action Levels (RALs), which are the concentrations above which soil removal is necessary to achieve the MCSs for these areas, were also calculated. In this SB, U.S. EPA is proposing 920 mg/kg of lead in soil as the MCS for the onsite manufacturing areas and the onsite grassy areas of the site, based on a site-specific risk assessment. U.S. EPA is proposing 400 mg/kg of lead in soil as the MCS in the offsite Arlington Avenue right-of-way and the Big Four Road right-of-way because institutional controls are impractical for these properties. After excavation and removal of soils with contaminant levels above the RAL and replacement with clean fill, the average of the post-remediation soil concentrations will meet the MCSs for this facility. This residual concentration will be protective of these receptors, even though the soils in some areas may have concentrations up to 920 mg/kg.

Exposure scenarios evaluated as part of the BHHRA for the soils on the Citizens Gas Property did not identify any current unacceptable exposure risks for commercial/industrial use on that property. Based on the current zoning of the Citizen's Gas property as commercial/industrial, U.S. EPA proposes to apply the commercial/industrial risk-based cleanup standards for this parcel.

Based on the results of the site specific BHHRA, the media cleanup standards and Remedial Action Levels for lead in soil are proposed to be as follows:

CLEANUP OBJECTIVES*

	On-site Manufacturing Area	On-site Grassy Area	Arlington Ave., Big Four Road and Railroad right-of-ways	Citizens Gas Property
MCS	920	920	400	1300
RAL	8,470	4,954	400	Not Applicable

* All values reported in mg/kg.

In the BHHRA, lead risks were evaluated for adult and adolescent receptors by comparing the predicted fetal blood lead level (BLL) for each receptor to U.S. EPA's BLL goal of 10 ug/dl. After excavating the soils contaminated per the action level described in the table (above), the predicted 95th percentile fetal BLL will meet our goal of 10 ug/dl. The residual risk from arsenic was calculated assuming that soil was remediated for lead in both the main facility and the grass area. Residual cancer risks range from 9x10-7 to 1x10-6. Residual noncancer risks range from hazard quotients of 0.1 to 0.2. The calculated cancer and noncancer risk associated with post remedial concentration of arsenic in the offsite properties fall below the U.S. EPA's target risk range of 1x10-6 to 1x10-4 and the hazard quotient of 1.

Additionally, soil to groundwater modeling shows that the concentrations of lead and arsenic remaining in soil after the proposed soil remediation will be less than the soil concentrations for which groundwater would be above the MCL (arsenic) or IDEM industrial default groundwater concentrations (lead).

SUMMARY OF ALTERNATIVES

Corrective measures alternatives are intended to mitigate potential exposure to, control migration of, and/or remediate the contaminants of interest. A step-wise process was used to select and evaluate corrective measures alternatives for implementation at the former RMC facility. The following remedial technologies were considered for remediation of soil and groundwater at the site. Where a particular technology was obviously inappropriate and not suitable for further retention a basis for such a determination is also provided.

SOIL REMEDIATION ALTERNATIVES

NO ACTION (ALTERNATIVE 1)
No Action is a general response action, which does not have any specific technologies or process options. The No Action alternative does not include any additional remedial responses for the Site. It was retained to provide a baseline to compare the relative benefits of the other options.

EXCAVATION (ALTERNATIVE 2)
Soils above the RAL will be excavated and the resulting area backfilled or re-graded to promote surface water drainage. The amount of excavation required will be dictated by the results of previous soil sampling. Alternative 2 must be implemented in conjunction with an On-Site Containment Cell (Alternatives 3A or 3B) or Stabilization and Off-Site Disposal (Alternative 4).

Alternative 2 would include excavating all onsite soils and sediments within the on-site manufacturing area that have concentrations above the RAL of 8,470 mg/kg for lead, and excavating the soils within the onsite grassy areas above the RAL of 4,954 mg/kg for lead. Alternative 2 also includes excavating offsite soils along the Arlington Avenue right-of-way, railroad right-of-way and the Big Four Road right-of-way above the RAL of 400 mg/kg for lead.

The volume of soil to be excavated for Alternative 2 is estimated to be 3,224 cubic yards (cy) in the on-site areas outside the Solid Waste Management Units (SWMUs), 1,771 cy within the SWMUs, 1,057 cy from the grassy areas, 3,177 cy from the railroad right of way, 1,269 cy from the Arlington Avenue right of way and 3,640 cy from the Big Four Road right of way. The volumes of pavement (concrete and bituminous) and building floors (all concrete) that must be removed to access the soils to be excavated are 3,366 cy for the SWMUs and 1,325 cy for the areas outside the SWMUs. Excavated areas will be backfilled with clean soils as specified in the BHHRA. Confirmatory soil sampling of excavations will be specified in the Corrective Measure Implementation Program Plan. It is also assumed that 100 confirmatory samples will be required. This alternative includes the implementation of a deed restriction on the property indicating that any future development or reuse of the property must be supported by the exposure scenarios evaluated in the BHHRA or the BHHRA must be rerun to support any other use other than evaluated in the BHHRA.

Alternative 2 will include the demolition of several buildings, including the Material Storage, Battery Breaker, Filter Press, and Wastewater Treatment Buildings, and the removal/closure of the Surface Impoundment. Removal of the Filter Press and Wastewater Treatment Buildings will mean that storm water runoff and other water generated during corrective action could not be treated unless the existing system were replaced or relocated. Therefore, all surface water runoff must be collected and treated before disposal through a storm water outfall or transported for offsite disposal. All excavated soils and sediment above RAL would be managed using an on-site containment cell (Alternative 3A) or transported for off-site disposal. The building demolition will generate debris and rubble. Metal debris can be sent for recycling, but will require pressure-washing to remove dust and soil. The remaining debris and rubble from both the building and pavement demolition would be consolidated in the on-site containment cell. Wood, trash and other degradable materials generated during demolition would be sent off-site for disposal.

Although the RFI and CMS confirmed that the contamination of soil at the offsite Citizen's Gas property resulted from past operations at the RMC facility, the U.S. EPA agrees with RMC's BHHRA conclusion that the soils on this property do not pose any unacceptable risk. Concentration of lead in soil samples collected at the Citizen's Gas property did not exceed the media cleanup standard of 920 mg/kg for lead. The Citizen's Gas property is zoned commercial/industrial. However, since the commercial/industrial cleanup standards are applicable to this property, and no remediation is planned, this alternative requires implementation of a deed restriction on the Citizen's Gas property to make sure that its use is restricted to only commercial/industrial. As an alternative to a deed restriction, this alternative allows for soil removal on the Citizens Gas property to an MCS of 400 mg/kg of lead.

ON-SITE CONTAINMENT CELL (ALTERNATIVES 3A AND 3B)

Constructing a capped containment cell is a remedial technology typically chosen as a source controls action because it can effectively isolate impacted soil, reduce infiltration, prevent direct

exposure, and is adaptable to various Site conditions. Remediated soil, concrete, and other non-degradable rubble would be consolidated into a single location and capped. A wide range of readily available materials can be used to construct the cap. For this facility, U.S. EPA examined the construction of the on-site containment cell in the following two ways:

1) Alternative 3A - Composite Cover consisting of (from top to bottom) vegetative cover, 6" topsoil, 18" cover soil, geocomposite drainage layer, and HDPE geomembrane.

2) Alternative 3B - Bituminous Asphalt Cover consisting of (from top to bottom) bituminous concrete pavement, a geotextile filter fabric, and a crushed aggregate subgrade.

STABILIZATION AND OFF-SITE DISPOSAL (ALTERNATIVE 4)

This alternative involves sending excavated soils to an off-site disposal facility. Depending on the results of characterization analysis for the excavated soil, treatment may also be required. The evaluation has been completed based on the assumption that excavated soils will be stabilized on-site and disposed off-site at a non-hazardous landfill.

RESOURCE RECOVERY AND RECYCLING (ALTERNATIVE 5)

Excavated soils which have sufficiently high concentrations of lead could be processed through a secondary lead smelter for the purpose of recovering the lead. Based on discussions with secondary lead smelter personnel, the concentrations that would be conducive to resource recovery and recycling would be in excess of 100,000 mg/kg (i.e., 10% lead) and preferably greater than 250,000 mg/kg. None of the soil samples collected as part of the RFI was above 100,000 mg/kg. Only 10 of the soil borings conducted as part of the closure investigation for the SWMUs encountered one or more samples with lead concentrations greater than 100,000 mg/kg. These are generally situated within the footprint of the former outdoor waste piles and are estimated to represent less than five (5%) of the total amount of material requiring remediation. Therefore, the Resource Recovery and Recycling option (Alternative 5) was not retained for further evaluation as a site wide alternative. Although not suitable for site wide application, resource recovery and recycling may still be considered as a possible disposal alternative for specific solid waste streams generated during corrective action with very high lead concentrations. Implementation of this alternative would be dependent on the cooperation of an off-site lead smelting company.

IN-SITU STABILIZATION (ALTERNATIVE 6)

Stabilization involves a physical or chemical reduction of the mobility of hazardous constituents. Immobilization typically provides a significant decrease in leachability and the potential for contaminant migration. Immobilization is accomplished through physical (i.e., microencapsulation) and chemical (i.e., pH control, changes in chemical species) processes. Physical processes involve the entrapment of contaminants within a solid matrix, thus, reducing contaminant mobility by decreasing the permeability of the contaminated material. Chemical

processes reduce contaminant mobility by various means such as converting the contaminant to a less mobile form or adjusting the pH of materials to reduce their solubility. Stabilization would not change the mass of contaminants present at the Site. Stabilization can be addressed via ex-situ or in-situ processes. Surface soil mixing allows for mixing without removal of treated materials. Shallow (8 to 12 inch) lifts of contaminated soil can be stabilized using modified construction equipment such as bulldozers. Excavators and caisson drilling rigs can be modified to deliver stabilization reagents to depths greater than 100 feet (as reported by various vendors). The degree of mixing varies with each of these technologies.

While in-situ stabilization decreases the mobility of the contaminants, it does not decrease the volume or toxicity of the contaminants. Additional measures would be required to prevent direct contact for protection of human health. In-situ stabilization is not a widely-accepted technology and has not been implemented full-scale for remediation of lead-contaminated soil, primarily due to the effort involved in application of reagents and the uncertainty in mixing thoroughness. When in-situ stabilization has been used, it has been on large, open sites with sufficiently large volumes of waste to justify the mobilization of specialized equipment and development and implementation of monitoring and testing protocol. Quality control could only be conducted through extensive investigation such as test pits or borings.

For the reasons cited above, the In-Situ Stabilization option (Alternative 6) was not retained for further evaluation as a Site wide alternative.

SOIL WASHING (ALTERNATIVE 7)

Soil washing technology consists of two primary processes: 1) use of a liquid wash solution to physically separate the large grain-size fraction (e.g., battery casings, gravel and sand) from the small grain-size portion or fines fraction (e.g., clay/silt particles); and 2) use of a chemical extraction agent to solubilize (dissolve) contaminants of concern (i.e., soil leaching), thereby providing higher contaminant removal efficiencies from the large grain-size (coarse) material and/or separating the contaminants from the fines fraction. The goal of treatment is to concentrate contaminants to the fines fraction of the material since most organic and inorganic contaminants tend to bind, either chemically or physically, to the clay/silt particles, and/or organic matter within the soil matrix. The large grain-size (coarse) fraction is 'cleaned', and there is a reduction in the volume of contaminated material but not the mass of the contaminant (lead).

The washing process typically involves the physical separation of contaminated material utilizing mineral processing equipment and techniques. Acids, caustics, and surfactants may be added to the process in an attempt to enhance contaminant removal by leaching. Chemicals which have been attempted by various parties for soil lead leaching include ethylenediamine tetraacetic acid (EDTA, a chelation agent which complexes lead and increases solubility) and nitric acid. Surfactants are commonly used to remove organic contaminants from soil. End products of the soil washing process include plastic casings, ebonite casings, washed soil (coarse-grained fraction), and the lead product (fine-grained soil fraction), all of which are solid fractions.

All of the solid end products would theoretically be clean (i.e., below RALs), except the lead product which have high lead concentrations. Generally finer soil particles with high concentrations of lead could be sent to a secondary lead smelter for recovery or stabilized via ex-situ methods and landfilled. The other end products which no longer contain high concentrations of lead (i.e., coarse soil and battery casings) could conceptually be used for clean fill, fuel supplements or alternatively landfilled. The washing solution would likely be treated and recycled as much as practicable until the end of the project. Treatment most likely would involve filtration and/or precipitation to remove lead. The number of vendors who have successfully completed full-scale projects is very limited as the technology is innovative. Due to the large variation in materials to be treated on-site and the fine material (i.e., silt and clay) in the soil, implementation of soil washing would be difficult. Bench-scale studies for similar projects have not proven to be successful in treating the coarse soil fraction to below TCLP limits for lead. Debris such as battery casing fragments are anticipated to be more difficult to clean because of their irregular size and shape of the casings results in hard to clean corners and cracks in which lead may reside. The intricate nature of this technology inherently requires high maintenance and frequent process modifications. Many of the additives used have hazardous characteristics themselves (i.e., acids and bases) and may require special handling and spill prevention/response plans. Implementation of this technology may require designing and fabricating a site-specific treatment plant. For these reasons, the Soil Washing option (Alternative 7) was not retained for further evaluation as a Site wide alternative.

PHYTOREMEDIATION (ALTERNATIVE 8)

Phytoremediation is an emerging technology which involves the use of trees and plants to aid in the remediation of soils and/or groundwater. Plants used for remediation of heavy metals include alyssum, hybrid poplars, Indian mustard, pennycress and sunflower. Phytoremediation of metals occurs through several processes including: Phytoextraction and Phytostabilization. Phytoextraction is the uptake of a contaminant by plant roots and translocation of that contaminant into the aboveground portion of the plants. The contaminant is removed by harvesting the plants. Phytostabilization is the immobilization of a contaminant through absorption and accumulation by roots, adsorption onto roots, or precipitation within the root zone of plants.

Phytoremediation is an innovative technology which may be effective in remediation of shallow (less than 1 ft below ground surface without repeated tilling and only as deep as 2 feet with such measures) soils. It requires wide-open areas that are not covered with impervious surface such as buildings and pavement. Obviously, the majority of the proposed remediation area is impervious and some of the proposed excavations are projected to be greater than 2 feet deep and as much as 4.25 feet deep; therefore, phytoremediation would not be conducive to remediation of those areas. The time required for implementation of phytoremediation is lengthy as plants and trees grow at a limited rate. As phytoremediation is not conducive to the proposed excavations and schedule, and as the technology is innovative and not widely applied, the Phytoremediation option (Alternative 8) was not retained for further evaluation as a Site wide alternative.

GROUNDWATER REMEDIATION ALTERNATIVES

NO ACTION (ALTERNATIVE 1)

No Action is a general response action, which does not have any specific technologies or process options. The No Action alternative does not include any additional remedial responses for the Site. It was retained to provide a baseline to compare the relative benefits of the other options.

INSTITUTIONAL CONTROLS (ALTERNATIVE 2)

Institutional controls would place limitations on the use of groundwater at the site to prevent consumption by human receptors. The institutional controls would be applied in the form of deed restrictions that would prevent the installation of potable groundwater wells at the site. The deed restriction would apply to current and future property owners.

SOURCE REMOVAL (ALTERNATIVE 3)

This alternative coincides with areas of contaminated soil areas considered for remediation to address soil contamination above. This alternative will not be further discussed in this document as it is being proposed as part of Soil Remediation Alternative 2 above.

MONITORED NATURAL ATTENUATION (ALTERNATIVE 4)

Monitored natural attenuation (MNA) is the stabilization and long-term shrinking of a contaminant plume by natural processes such as microbial degradation. This alternative is generally applicable only to dissolved groundwater plumes. In order to implement this alternative, the source of the contamination must first be removed and the presence and rates of natural degradation processes must be documented. Natural attenuation processes can be demonstrated through a variety of lines of evidence, including static or retreating chemical isoconcentration contours over time, changes in the ratios of parent to breakdown products, the presence of bacteria capable of degrading the contaminants of interest, and/or the presence of geochemical indicators of naturally occurring biodegradation.

The major component of MNA as a remedial alternative would be the long-term monitoring program to provide initial and continuing confirmation that the predicted biological activity and/or reductions in contaminant concentrations occur and remain effective. Risk and hazard management measures may be required to protect human health and the environment during the long term until overall effectiveness can be achieved.

MNA is appropriate as a remedial alternative where natural degradation can be currently documented. MNA is also appropriate as an option for future consideration after the source has been removed and monitoring data indicate that natural degradation may be occurring.

PERMEABLE REACTIVE BARRIER (ALTERNATIVE 5)

A permeable reactive barrier is a passive in-situ option which allows groundwater to pass through a porous media containing a catalyst/formulation. Relative to arsenic, the catalyst is typically an iron or manganese coated sand. The permeable barrier is placed downgradient of the source and is of sufficient length and depth to intercept the impacted groundwater. This technology was not determined to be feasible since the arsenic and lead plumes do not appear to be moving laterally beyond the facility boundary.

CONTAINMENT (ALTERNATIVE 6)

Groundwater containment is used to control or limit the lateral flow of groundwater in a finite area or region. Containment can be accomplished by using low permeability barrier walls constructed around the impacted groundwater. This technology was not determined to be feasible and was not retained because the contaminant plume is not moving laterally.

GROUNDWATER EXTRACTION AND TREATMENT (ALTERNATIVE 7)

Groundwater extraction and treatment involves the removal of impacted groundwater using wells or extraction trenches and treatment through an ex-situ treatment system prior to discharge, re-injection or discharge to the POTW. Extraction and treatment can be effective at reducing mobility and effectively reducing the mass and toxicity of the contaminants in groundwater. Such systems, however, are expensive to design, install and operate.

FINANCIAL ASSURANCE

The U.S. EPA will require that RMC demonstrate that adequate funds will be available to complete the construction as well as the operation and maintenance of the selected remedy. RMC must provide this financial assurance within 90 days of its receipt of U.S. EPA's selected remedy decision. Any of the following financial mechanisms may be used to make this demonstration: financial trusts, surety bonds, letters of credit, insurance, or qualification as a self-insurer by means of a financial test. RMC may request that the amount of the financial assurance be reduced after successfully completing the construction, and again from time to time during the operation and maintenance phase of the remedy.

Cost Analysis

The estimated costs for the proposed Soil and Sediment alternatives including capital costs and the annual operation and maintenance costs are presented in Attachment A will be revised upon selection of final remedial alternatives for the RMC facility.

EVALUATION OF THE PROPOSED REMEDY AND ALTERNATIVES

The selected remedies for cleaning up contaminated media at the RMC facility as discussed above are excavation of all onsite and offsite soils and sediments above the RALs (Soil and Sediment Alternative 2), consolidation of all excavated soils and sediments above RAL including all debris from demolition in an onsite Containment Cell and placement of a composite cap on the cell (Soil and Sediment Alternative 3A), shipment of some excavated soils and sediments offsite for recycling or disposal (Soil and Sediment Alternative 4), institutional controls (Groundwater Alternative 2), and Monitored Natural Attenuation (Groundwater Alternative 4). The selection of these remedial measures is based on the following reasons: (a) the facility will not pose acute risks to humans and other ecological receptors when the remedy is complete; (b) the preponderance of wastes at the units in question have been removed/or will be consolidated in a cell with a composite cap and/or disposed offsite; (c) the communities do not use the groundwater as a drinking water source since drinking water supplies are already provided by the local governments in the area; (d) the alternatives do not require frequent or complex operation and maintenance and (e) the remedy will achieve the corrective action objectives and will provide for continued productive use of the property.

The following discussion profiles the performance of the proposed remedy against the U.S. EPA's remedy selection criteria. The proposed remedy must meet all four of the following threshold criteria.

Protection of Human Health & the Environment

The selected remedy should mitigate the short and long term potential for exposure to hazardous constituents and protect human health during and after its implementation. The overall protection of human health is addressed most effectively at the RMC facility by the proposed alternatives. The isolation and capping of the impacted soils/sediments within the cell will reduce exposure and leachability of this material to the environment.

Monitored Natural Attenuation in combination with source removal may under certain conditions (i.e., through sorption or oxidation-reduction reactions) reduce the mass toxicity, mobility, or concentration of contaminants thereby further reducing or eliminating potential risk posed by these contaminants.

Attainment of Media Cleanup Standards Set by U.S. EPA

The excavation of contaminated soils and sediments (source removal) and consolidation in a Containment Cell with an impermeable geomembrane will reduce the leachability of lead left in place post remediation. Concentrations below the Media Cleanup Standards are achievable through these remediation processes. Compliance with applicable ground water protection standards would be addressed by monitoring the existing onsite wells and installation of additional wells to monitor the efficacy of the remedial alternatives.

Controlling Sources of Release

The selected remedies should provide the greatest improvement to the environment over the shortest period of time. Approximately 18,829 cubic yards of contaminated soils and sediments will be excavated and consolidated in a Containment Cell. The overall protection of the environment is addressed most effectively at RMC by these proposed alternatives. Characteristically hazardous soils/sediments, will be excavated and consolidated in an onsite cell.

Compliance with Applicable Standards for Management of Remediation Waste

For each of the alternatives considered for this facility, U.S. EPA would require compliance with all applicable Federal, State and local requirements. For example, any shipment of hazardous waste off-site under Soil and Sediment Alternative 4 would entail compliance with the applicable standards for generators and transporters of hazardous waste.

The following five balancing criteria are used for choosing among alternative remedies that meet the threshold criteria. For the RMC facility, these criteria would be used to choose between Soil and Sediment Alternative 3A and Alternative 3B, as well as Groundwater Alternative 4 and Alternative 7.

Long-term Reliability and Effectiveness

Soil and Sediment Alternatives 3A and 3B are both capping remedial methodologies. Alternative 3A consists of a vegetative cover over a geocomposite drainage layer and HDPE geomembrane, while, Alternative 3B consists of an asphalt cover over a geotextile filter fabric. Both methodologies can isolate impacted spoil and reduce infiltration. However, the integrity of the cover specified by Alternative 3B may be easily compromised and tends to be more susceptible to impacts from weather. It requires intensive and regular maintenance over a long period of time. The only maintenance required under Alternative 3A is regular mowing of the vegetative cover. Soil and Sediment Alternative 3A is more reliable and effective in long-term that Alternative 3B.

Groundwater Alternative 4 is a natural process of degrading contamination in place. Groundwater Alternative 7 is a process which removes the contaminated groundwater for treatment and discharge. Both Alternatives 4 and 7 can be reliable and effective in the long-term. There is no significant difference between Groundwater Alternative 4 and Alternative 7 for this criterion.

Reduction of Toxicity, Mobility or Volume of waste
There is no significant difference between Soil and Sediment Alternative 3A and Alternative 3B for this criterion. There is no significant difference between Groundwater Alternative 4 and Alternative 7 for this criterion.

Short-term Effectiveness
There is no significant difference between Soil and Sediment Alternative 3A and Alternative 3B for this criterion. There is no significant difference between Groundwater Alternative 4 and Alternative 7 for this criterion.

Implementability
There is no significant difference between Soil and Sediment Alternative 3A and Alternative 3B for this criterion. There is no significant difference between Groundwater Alternative 4 and Alternative 7 for this criterion.

Cost
A cost estimate for each alternative was prepared that considers capital expenditures as well as operation and maintenance costs. Capital expenditures include both direct and indirect costs. Direct capital costs include material and labor used in construction and equipment and services used in the treatment of affected media. Indirect capital costs include engineering expenses, licensing and permit costs, start up and take down costs, and a contingency allowance or unforeseen circumstances. Operation and maintenance costs include post construction costs necessary to ensure the continued effectiveness of the corrective measure. These costs include operating labor costs; repairs and scheduled maintenance; supplies and utilities; subcontractor services; disposal and treatment costs of generated wastes; and a reserve or contingency fund.

There is no significant difference between Soil and Sediment Alternative 3A and Alternative 3B for this criterion. Groundwater Alternative 7 is much more expensive that Alternative 4 to design, install and operate.

In summary, the proposed alternatives provide the best balance of tradeoffs among the alternatives with respect to the evaluation criteria. The proposed alternatives are protective of human health and the environment and will effectively remove the source of contaminants into the groundwater so as to reduce or eliminate further contamination. All applicable standards regarding groundwater protection and onsite/offsite waste management would be addressed under this proposal and complied with during the corrective measures implementation process. Therefore, for the current groundwater contamination, U.S. EPA proposes that RMC implement Soil and Sediment Alternatives 2, 3A, 4 in combination with institutional controls and Monitored Natural Attenuation (MNA).

PUBLIC PARTICIPATION

U.S. EPA solicits input from the community on the cleanup methods proposed for each of the corrective measure alternatives. The public is also invited to provide comment on alternatives not addressed in this Statement of Basis (SB). U.S. EPA has set a public comment period from ....., ... to ...., 2007 to encourage public participation in the selection process.

The Administrative Record for the RMC facility is available at the following location:

Beech Grove Public Library
1102 Main Street
Beech Grove, Indiana 46107
(317) 788-4203

E-mail: bgplreference@bgpl.lib.in.us

Hours: Monday thru Thursday
9:00 AM - 8:00 PM
Friday and Saturday
9:00 AM - 5:00 PM

and

U.S. EPA, Region 5
Waste Management Division Records Center
77 West Jackson Boulevard, 7th Floor
Chicago, Illinois 60604
(312) 353-5821
Hours: Mon-Fri, 8:30 a.m. - 5:00 p.m.

After consideration of the comments received, U.S. EPA will select the remedy and document the selection in the Response to Comments (RTC). In addition, comments will be summarized and responses provided in the RTC. The RTC will be drafted at the conclusion of the public comment period and incorporated into the Administrative Record.

Written comments should be sent to:

Jonathan Adenuga
U.S. Environmental Protection Agency
77 West Jackson Boulevard, DRE-9J
Chicago, Illinois 60604

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
FINAL DECISION AND RESPONSE TO COMMENTS FOR SELECTION OF REMEDIAL ALTERNATIVE

FOR
REFINED METALS CORPORATION FACILITY
BEECH GROVE, INDIANA

August, 2009

FINAL DECISION AND RESPONSE TO COMMENTS
SELECTION OF FINAL REMEDIAL ALTERNATIVE
FOR
Refined Metals Corporation Facility
Beech Grove, Indiana

Introduction

This Final Decision and Response to Comments (FD/RC) is presented by the Environmental Protection Agency (EPA) for the Refined Metals Corporation (RMC) Facility located in Beech Grove, Indiana. The final decision includes this decision document, EPA's Response to Comments (Attachment I), and the Statement of Basis (Attachment II). The Statement of Basis provided the proposed remedy and was made available for public review and comment from June 27, 2008 to August 11, 2008. This FD/RC selects the final remedy to be implemented at the Refined Metals Corporation Facility based on the Administrative Record and public comments. EPA's Response to Comments addresses substantive comments received on the Statement of Basis during the 30 day public comment period.

Assessment of the Site

The response action documented in this FD/RC is necessary to protect human health and the environment.

Selected Remedy

EPA has selected the following remedial components as the remedy to address contamination soil, groundwater and sediment at the Refined Metals Corporation Facility:

For lead in onsite soils and sediments, as well as offsite soils along the Arlington Avenue right-of-way, the railroad right-of-way, and the Big Four Road right-of-way, RMC will implement the following tasks as described is the Statement of Basis:

- Excavation of the most highly contaminated soils and sediments,
- Demolition of the Material Storage Building, Battery Breaker Building, Filter Press Building, Waste Water Treatment Building and Surface Impoundment, and
- Placement of institutional controls to restrict the use of the property to only commercial/industrial land use.

To assure safe and effective long-term management of the excavated soils and sediments as well as debris and rubble generated from the excavation and demolition, RMC will implement the following tasks as described in the Statement of Basis, except that the

location of the Containment Cell has been changed:

- The Containment Cell will be located in the northwest portion of the RMC property, north of the former operational area and parking areas, and west of the drainage ditch,
- Placement of excavated soils and sediments, as well as the debris and rubble from the building demolition in an onsite Containment Cell,
- Encapsulation of the excavated soils and sediments beneath an impermeable geomembrane cap covering the entire footprint of the Containment Cell and a vegetative cover above the geomembrane,
- Establishment of long-term operation, maintenance and groundwater monitoring of the Containment Cell including existing monitoring wells and
- Placement of institutional controls on the Containment Cell to prevent any disturbance, excavation or other activity that might result in a release of any materials contained in the cell.

To manage any excavated soils and sediments as well as any demolition debris or ruble that is not safely managed in the onsite containment cell RMC will implement the following task:

- Shipment of these materials offsite to another facility for recycling or disposal in accordance with all applicable Federal, State and local regulations.

For Lead in soils at the offsite Citizen's Gas property: The commercial/industrial cleanup standards are applicable to this property, and EPA agrees that no remediation is warranted provided that the land use is restricted to commercial/industrial. Thus, the selection of this final remedy requires implementation of a deed restriction on the Citizen's Gas property to make sure that its use is restricted to only commercial/industrial. Citizen's Gas and RMC have reached an agreement regarding the land use restriction and the majority of comments raised in by Citizen's Gas to EPA's draft statement of basis have been rendered moot. Some construction work will be performed under this agreement between RMC and Citizen's Gas, but that is independent of this final remedy.

For On-site Groundwater: To prevent human consumption of groundwater at the Facility, RMC will place a deed restriction preventing the installation of potable groundwater wells at the Facility. Institutional controls are also necessary to prohibit the use of shallow on-site groundwater as a drinking water source and restrict construction activities in on-site areas where humans may come in direct contact with shallow groundwater. In addition, Monitored Natural Attenuation (MNA) will be implemented as the principal means of restoring the on-site contaminated groundwater at the Facility. Monitored natural attenuation must demonstrate reduction or stabilization of lead within 10 years of this Final Decision. Within this reasonable

time frame (10 years), we expect that monitored natural attenuation will restore the on-site groundwater such that it would be available for use as a source of commercial or residential drinking water.

Document to be submitted:
RMC shall submit a corrective measures design for the excavation and off-site treatment/disposal, demolition and Containment Cell of lead contaminated soils and sediments identified above to EPA for review and approval within 60 days of this Final Decision. The design work consists of the design plans and specifications, proposed remediation objectives, construction cost estimate, construction quality assurance objectives, waste disposal requirements, project schedule, quality assurance project plan, sampling and analysis plan, and health and safety plan. RMC shall implement the approved final design, incorporating EPA comments. Remedy construction must be completed within one year of this Final Decision, and a Construction Completion Report and O&M Plan must be submitted to EPA for review and approval at that time. In the report, a registered professional engineer and the RMC project Manager shall certify that the remedy for lead-contaminated soils and sediments from these areas have been conducted in accordance with the EPA approved final design and specifications, to the best of their knowledge, and cleanup objectives have been attained. The report shall include as-built drawings signed and stamped by a registered professional engineer. Implement any approved final O&M Plan, incorporating EPA comments.
The operation and termination of the MNA remedy must be described in the Corrective Measures Implementation (CMI) workplan to be submitted by RMC for approval by EPA. Every 2 years, RMC must submit a report assessing whether MNA is progressing satisfactorily. In the CMI workplan, RMC will propose the criteria for measuring satisfactory progress. The CMI workplan is subject to EPA approval. If the comprehensive groundwater monitoring program does not demonstrate that monitored natural attenuation is not performing as expected, then RMC must implement a contingent remedy to achieve the corrective action objectives for this project.

Other Certification, Monitoring, Reporting, Institutional Control, and Financial Assurance Requirements.

<u>As part of the Corrective Action, RMC will:</u>

- Provide certification by a responsible corporate officer or duly authorized representative of all documents submitted pursuant to this Final Decision, as required in the Consent Decree entered in this matter.
- Implement institutional controls for the land, soil, and groundwater portions of the RMC Facility that are the subject of this Final Decision. The institutional controls shall ensure that RMC property use remains industrial/commercial; the soil and onsite Containment Cell at the facility are not disturbed in a manner that poses a risk to workers or interferes with the implementation of the final remedy; groundwater monitoring wells are maintained until the proposed MNA criteria are achieved and the wells are approved for abandonment by EPA.

- Obtain financial assurance for completion of the final remedy, including operation and maintenance (O&M), within 90 days of the Final Decision. Provide an updated detailed estimate of capital costs for implementing the final remedy

- Submit CMI monthly progress reports to EPA during the design and construction phases detailing work performed to date, data collected, problems encountered, project schedule, and percent project completed. Progress reports are due by the 10th day of each month following the Final Decision. Submit CMI progress reports semiannually for O&M activities upon approval of the Construction Completion Report.

The final remedy selected by EPA meets the threshold criteria that reflect the performance standards that must be achieved, including:

- Protect Human Health and the Environment.
- Attain Media Cleanup Standards Set by EPA
- Control the Sources of Releases.
- Comply with Any Applicable Standards for Management of Wastes.

The final remedy also considers balancing criteria that represent a combination of technical measures and management controls that helped identify the best remedy, including:

- Long-term Reliability and Effectiveness.
- Short-term Effectiveness;
- Reduction in the Toxicity, Mobility, or Volume of Wastes.
- Implementability.
- Cost.

Public Participation and Comments

A forty-five (45) day public comment period was held from June 27, to August 11, 2008. Comments were received from Citizen's Gas and the City of Beech Grove, Indiana during the public comment period.

Public Comments and EPA's Response to Comments

Comments received on the proposed remedy from the Citizens Gas/Citizens Energy Group and City of Beech Grove were considered and addressed in the final remedy. As a result, the proposed remedy was modified by EPA to address concerns regarding the location of the Containment Cell for consolidation of remediation wastes that ensures proper storm water management and potential future development of the RMC facility.

The following narrative summarizes written comments on the proposed remedy and EPA's response to each comment. Each comment is numbered and presented in italicized capital type.

Citizens Gas, a neighboring property owner, raised a number of issues regarding the Statement of Basis in a September 9, 2008, letter. After reaching an agreement with Refined Metals Corporation, Citizens Gas withdrew all of its comments except the following:

1. Citizens requested that the containment cell be located at the location on Refined Metals property in the northwest portion of the Refined Metals Property, north of the former operational and parking areas and west of the drainage ditch.

Response: EPA agrees that the proposed location of the containment cell could have had some adverse impacts on Citizens' property. The original location was proposed based upon EPA guidance which suggested that it is appropriate to manage waste in its place rather than transfer it to another location. However, EPA interprets the policy to allow (or the policy allows) under certain conditions, hazardous wastes may be moved within such areas without triggering RCRA land disposal restrictions. Therefore, the containment cell will be relocated. The location proposed by Citizens is appropriate as indicated in the Final Decision.

2. Citizens requested that Refined Metals be required to develop a storm water management plan both during and following construction of the corrective measures to prevent contaminated storm water from migrating onto Citizen's property.

Response: The relocation of the containment cell, as described above, and proper engineering design, should alleviate runoff from the Refined Metals property. The final design plan will be submitted to EPA for approval and the design will be properly engineered and aesthetically acceptable.

3. Citizens requested that Refined Metals be required to develop an air deposition management plan that will prevent contaminants from becoming air born during Refined Metals implementation of its corrective measures.

Response: EPA agrees that airborne particulate matter generated during excavation process should be addressed. EPA will require that RMC include in their Corrective Measures Implementation Plan (CMI) to be submitted a particulate matter air suppression mechanism to prevent contaminant from becoming air born.

City of Beech Grove Comments

The City of Beech Grove provided comments which focused on the future development potential of the property, specifically that the design, location, and timing of the action and the involvement of the City are critical. The following comments were raised:

1. The City requested that the following be considered in the decision regarding the containment cell:

a. Minimizing the volume of the contaminated media contained onsite (and thus the size

of the cell) to the extent possible considering that off-site disposal is a viable option;

b. Locating the containment cell in a manner that maximizes the acreage for development purposes, particularly indicating that locating along the boundary of Citizens Gas facility would be good from future reuse options;

c. Sizing the containment cell in a manner that does not detract from the visual aesthetics of the site for potential future redevelopment (balancing vertical and horizontal dimensions); and

d. Establishing a perimeter, access points, and access control for the containment cell to not limit future redevelopment.

Response: As described above, EPA has agreed to relocate the containment cell to the northwest corner of the RMC property. The Containment Cell will not be any larger than necessary, and the design will be properly engineered and aesthetically acceptable. These issues will be addressed in the CMI workplan to be submitted to EPA for approval

2. The City requested that EPA expedite the Workplan process so that implementation of the corrective measures can commence.

Response: EPA will work as expeditiously as possible to review and approve the Workplan for implementation of the Final Remedy. The Consent Decree related to this matter requires Refined Metals to submit to EPA for approval a Corrective Measures Implementation Program Plan within 60 days of receiving notification of the selected corrective measures.

3. The City requested that it be designated as a corresponding party in the Workplan development process and implementation of corrective measures activities, and that a standard and a process for ongoing communication with the City be incorporated into the Workplan.

Response: EPA has an entered Consent Decree with Refined Metals that outlines the requirements for communication regarding the development of plans and implementation of measures. EPA is certainly willing to keep the City informed about the process of implementing the Final Decision. EPA can share publicly available documents including workplans, reports, and correspondence. As part of the Corrective Measures, Refined Metals will prepare and implement a Community Relations Plan (CRP). The CRP will designate a public repository for information regarding the site.

Administrative Record

The Administrative Record upon which the final remedy was selected is available at the Beech Grove Public Library, 1102 Main Street, Beech Grove, Indiana and the 7th Floor Records Center at EPA Region 5, 77 W. Jackson Blvd., Chicago, IL.

Declaration

Based on the Administrative Record compiled for this corrective action, EPA has determined that the selected remedy selected for the RMV Facility is appropriate and is protective of human health and the environment.

_____ Date_____

Margaret Guerriero Director
Land and Chemicals Division
U.S. Environmental Protection Agency
Region 5

Attachments

Summary of Design Approaches
Refined Metals Corporation
Beech Grove, Indiana

Consent Decree Requirements	Final Decision Document	Proposed Design Approach
Draft CMIPP (60 days from receipt of selected corrective measure) ***- 30 day regulatory review -*** Final CMIPP (30 days after receipt of regulatory comments on draft) ***- 30 day regulatory review -*** Draft submittals/Tasks XIIIA through F (120 days after selection of a Corrective Measure) Preliminary Design (45 days after regulatory approval of Final CMIPP) ***- 45 day regulatory review -*** Intermediate Design (45 days after submittal of Preliminary Design) ***- 45 day regulatory review -*** Pre-Final Design (45 days after submittal of Intermediate Design) ***- 30 day regulatory review -*** Final Design (35 days after regulatory approval of Pre-Final Design) ***- 15 day regulatory review -***	***"RMC shall submit to EPA for review and approval within 60 days of this Final Decision a Corrective Measures Implementation (CMI) workplan for the excavation and off-site treatment/disposal, the building demolition, and the construction of the Containment Cell for lead contaminated soils and sediment. The design work consists of the design plans and specifications, proposed remediation objectives, construction cost estimate, construction quality assurance objectives, waste disposal requirements, project schedule, quality assurance project plan, Community Relations Plan, sampling and analysis plan, an air deposition management plan and health and safety plan."***	Summary of design process including 1) general approach, 2) anticipated permitting requirements, 3) design deliverables, 4) schedule. (30 days from receipt of Final Decision Document) ***- 30 day regulatory review -*** Respond to regulatory comments on the design process (2 to 3 weeks receipt of regulatory comments) ***- 15 day regulatory review -*** Submit Preliminary (30%) Design and meet with EPA & IDEM to review 45 days after responding to regulatory comments above) ***- 0 day regulatory review -*** Submit Pre-Final (95%) Design (45 days after submittal of Preliminary Design) ***- 60 day regulatory review -*** Submit Final (100%) Design (21 days after regulatory comments on Pre-Final Design) ***- 15 day regulatory review -***
Notes: - approximately 15 month design process - remediation in 1 year impossible - various components of design phased in at various steps in design process	Notes: - Phasing of submittals and submittal deadlines unclear - does not seem to be based on Consent Decree requirements	Notes: - generally follows requirements of Consent Decree but accelerates schedule - approximately 9 month design process - all required components of the final design included in all steps of the design process - 60 day bid/contractor selection/contracting, and 3 month construction period makes initiation of remediation activities in Spring 2011 likely unless the timeframes specified above are shortened.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

January 22, 2008

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

REPLY TO THE ATTENTION OF:

Matthew A. Love
Manager-Regulatory Affairs
Exide Technologies
3000 Montrose Avenue
Reading, PA 19605

Refined Metals Corporation
Corrective Measures Study report
IND 000 718 130

Dear Mr. Love:

The United States Environmental Protection Agency (U.S. EPA) has completed review of the August 6, 2007, letter and the revised Phase II Corrective Measures Study (CMS) Report for the Refined Metals Corporation (RMC) located in Beech Grove, Indiana. The U.S. EPA is providing you with a conditional approval of the August report contingent on RMC addressing the two issues discussed below.

Issue 1

Revise Alternative 4 of the CMS report. Offsite Citizen's Gas contamination was not addressed in Alternative 4. Alternative 4 must be revised to include implementation of a deed restriction on the Citizen's Gas property. Although the RFI and CMS confirmed the contamination of soil at the offsite Citizen's Gas property resulted from past operations at the RMC facility, the U.S. EPA agrees with RMC's BHHRA conclusion that the soils on this property do not pose any unacceptable risk. Concentration of lead in soil samples collected at the Citizen's Gas property did not exceeded the media cleanup standard of 920 mg/kg for lead. The Citizen's Gas property is zoned commercial/industrial. However, since the commercial/industrial cleanup standards are applicable to this property, and no remediation is planned, RMC must implement a deed restriction on the Citizen's Gas property's deed to make sure that its use is restricted to only commercial/industrial. However, RMC can clean up the Citizens Gas property to a media cleanup standard of 400 mg/kg of lead instead of implementing the institutional control if it wishes to do so.

Issue 2

Revise Section 3.3.2, Groundwater of the CMS report. The U.S. EPA does not authorize the use of SPLP to be performed in lieu of groundwater sampling. You proposed to perform additional soil and// or groundwater characterization by analyzing selected soil samples for leachability using method 1312 for SPLP. There is no regulatory application for the SPLP test in to RCRA corrective action investigations at Federal lead sites. Finally, we are preparing a Statement of Basis for the RMC site to be sent out for public comment. The revised CMS Report should be submitted to U.S. EPA within 15 days of receipt of this letter.

If you have any questions, I can be reached at (312) 886-7954.
Sincerely,

Jonathan Adenuga
Corrective Action Section 2
Remediation & Reuse Branch

cc: Ruth Jean, IDEM

Refined Metals Corporation

August 6, 2007

Mr. Jonathan Adenuga
United States Environmental Protection Agency
77 West Jackson Boulevard
Chicago, IL 60604-3590

Re: EPA Response to Comments Letter (May 29, 2007)
Refined Metals Corporation
Corrective Measures Study Report
IND 000 718 130

Dear Jonathan,

Enclosed for your review are Refined Metals Corporation's (RMC) responses to EPA comments dated May 29, 2007. The EPA comments pertain to the latest version of the Phase II Corrective Measures Study (CMS) Report. Also enclosed is a revised version of the CMS Report.

In general, the EPA comments pertain to groundwater, a potential change in the recommended alternative for soil and sediment remediation, and remediation of offsite properties. RMC believes the attached addresses EPA comments regarding groundwater. Regarding the potential change in the recommended soil and sediment remediation approach, some clarification is warranted based on the response issued by the EPA. As you know, the remedy currently recommended by RMC is onsite consolidation and capping. RMC is evaluating whether excavation and offsite disposal might be a more preferable alternative when future land use is considered. The soil cleanup standard and risks posed by soils to remain in place would be the same under either alternative. It is thought that EPA would not object to switching to an offsite disposal remedy should it prove cost effective. At the time RMC submitted the last response to EPA comments, RMC was still evaluating this issue.

One of the key considerations regarding the offsite disposal alternative is remediation of off site properties. Recently, RMC met with the Mayor of Beech Grove to discuss the City's plans for redevelopment of the area. During that meeting, the Mayor indicated that the adjacent Citizen's Gas property is zoned commercial/industrial and would always be zoned as such. You will recall that the baseline human health risk assessment concluded that soil at the Citizens Gas property does not pose an

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Mailing Address: 3000 Montrose Avenue •Reading, PA 19605

unacceptable risk to potential receptors. Based on current zoning, and future zoning as indicated by the Mayor, there are no indications that use of the Citizens Gas property will ever be anything but commercial/industrial in the future. Therefore, RMC believes it reasonable to apply a commercial/industrial standard to the Citizens Gas property – standards under which no additional remediation is warranted. Consequently, all references to remediation of soil at the Citizens Gas property have been removed from the CMS. RMC still proposes to remediate sediment in the right-of -way for Arlington Avenue, which is owned by Marion County and the right-of-way for the CSX railroad tracks to the north of the site.

I certify under penalty of perjury that the information contained in or accompanying this CMS Report is, to the best of my knowledge after thorough investigation, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. This certification is being made at the direction of, and on behalf of, Refined Metals Corporation.

Sincerely,

Matthew A. Love

Enclosures

ATTACHMENT TO COVER LETTER

Comment: 1. The response is partially adequate. Based on the NTU >1000, MW-3 should be redeveloped or replaced. Also, revise Table 2B (Summary f Inorganic Groundwater Results) to address the "##########" nomenclature found in two Sampling Event columns.

Response: Table 2B *Summary of Inorganic Groundwater Results* has been revised to show the dates of the sampling event.

Comment: 2. The response does not appear adequate. According to the response, off-site areas will not be remediated until Refined approaches the adjacent property owners with a cleanup plan and a request for access. Remediation of off-site areas should not be delayed by the on-site remediation alternative selection process. Revise the Report to provide details regarding off-site soil remediation and documentation of negotiations with off-site property owners.

In addition, language within the Report states that "off-site properties cannot be deed restricted" while language within the Response states that, "If access to perform the remediation is denied, then the deed restriction will indicate that the property has elevated lead concentrations and can only be utilized for exposure scenarios consistent with the Baseline Human Health Risk Assessment." It is unclear how Refined could apply deed restrictions to properties owned by third parties. Revise the Report to discuss how deed restrictions will be implemented on off-site areas or remove these statements.

Response: See cover letter.

Comment: 4. The response does not appear adequate. According to the response, detailed discussions with the off-site property owners will not commence until Refined, the U.S. EPA, and the Indiana Department of Environmental Management (IDEM) agree on an overall remedy for the site. The Response also states that Refined has been re-evaluating which alternative it wishes to recommend and is reluctant to communicate with off-site property owners until an alternative has been selected and approved by the U.S. EPA and IDEM. As stated in the Response to U.S. EPA Comment 2, remediation of off-site areas should not be delayed by the on-site remediation alternative selection process. In addition, it is Refined's responsibility to inform the off-site property owners of its intentions regarding off-site soil/remediation. As such, communication with off-site property owners should not be delayed. Revise the Report to provide details regarding off-site soil remediation and documentation of negotiations

with off-site property owners. In addition, revise the Report to identify and more adequately describe the alternative which Refined wishes to recommend.

Response: See cover letter.

Comment: **5. The response is partially adequate. The response states that "any battery casings encountered during remediation of the Site will be managed with site soils." It is understood that some battery casing fragments may be encountered during remediation and managed with site soils. However, where possible, large battery casing fragments and whole battery casing should be sent off-site for disposal. Revise the Report to clarify that whole battery casings and large battery casing fragments will be sent off-site for disposal.**

Response: It is unclear what regulatory or technical basis would require that whole battery casings or large battery casing fragments be sent off-site for disposal. Because the battery casings and battery casing fragments are being generated as part of an on-site cleanup, they may be placed in the on-site containment cell. Because the battery casings are incompressible and do not decompose they do not compromise the integrity of the containment cell stability of its cover. Therefore, no change has been made that would require off-site disposal of battery casings or battery casing fragments.

Comment: **7. The response is partially adequate. According to the response, Refined "proposes to utilize offsite soils and sediments below the 1,000 mg/kg lead screening level for onsite backfill." However, the locations where the offsite soils will be excavated and where the soils will be placed onsite have not been provided, and rationale for the proposal to use soils containing higher lead concentrations than originally proposed for backfill should be provided. Refined should clarify where the offsite soils will be excavated and where the soils will be placed onsite. Justification should also be provided for the use of offsite soils with lead screening levels up to 1,000 mg/kg for onsite backfill.**

Response: Because Citizens Gas will no longer be remediated, this comment is no longer relevant.

Comment: **<u>Section 6.2 (Groundwater), Pages 6-28 - 6-39</u>: Groundwater alternatives have been evaluated in this version of the Report (and not in previous versions of the Report). This evaluation appears deficient, lacking rationale and detail. For example, the Report suggests that groundwater extraction and treatment over a five year period a viable alternative. However, soils containing lead at concentrations greater than 1,000 mg/kg will be left in place in several areas of the facility.**

Therefore, it is likely that infiltration of water through soils and into groundwater will continue to contaminate groundwater and that additional monitoring, and possible extraction and treatment, will be required. Also, monitored natural attenuation (MNA) is presented as a viable remedy for inorganics. However, very little site-specific detail is provided to support the MNA is indeed occurring onsite. Revise the Report to provide a more detailed evaluation for groundwater alternatives. If MNA is the recommended alternative, ensure that the factors outlined in U.S. EPA's guidance document *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites*, dated April 21, 1999 are included in this evaluation.

Response: Pursuant to the telephone conversation between USEPA and Refined on June 22, 2007, Advanced GeoServices has responded to this comment on behalf of USEPA by providing additional detail to the recommended options. Those options are Alternative 2 *Deed Restrictions*, Alternative 3 *Source Removal*, and Alternative 4 *Monitored Natural Attenuation.* The greatest emphasis has been placed on the source removal alternative, as this represents the most significant component of addressing groundwater degradation. Provided in the report is additional information regarding the location of the elevated arsenic and groundwater concentrations and soil-to-groundwater partitioning calculations. The concentrations show that groundwater impact is limited to area of the former Outdoor Waste Piles north of the former battery breaker and in the vicinity of MW-1. The Soil-to-Groundwater Partitioning Model calculations and summary discussions show that groundwater will be protected from further degradation by the proposed soil and sediment removal. Relative to the occurrence of Natural Attenuation, text has been added discussing the favorable conditions for adsorption observed in groundwater samples collected during January 2007, especially high iron and bicarbonate alkalinity, neutral pH, low TOC and low ORP. We have also included calculations based on the Retardation Equation that estimate that since operation of the facility began in 1968, arsenic and lead in groundwater would have traveled less than 30 feet and 17 feet, respectively. In addition, we have estimated that it would take over 1,000 years for arsenic in groundwater to reach the southern property line from the outdoor waste pile immediately north of the battery breaker, if a source remained in-place and was able to propagate the release for that length of time.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

March 1, 2007

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

REPLY TO THE ATTENTION OF:

Matthew A. Love
Manager-Regulatory Affairs
Exide Technologies
3000 Montrose Avenue
Reading, PA 19605

Response to Comments
Refined Metals Corporation
Corrective Measures Study report
IND 000 718 130

Dear Mr. Love:

The United States Environmental Protection Agency (U.S. EPA) has completed review of your January 15, 2007, letter and the Phase II Corrective Measures Study (CMS) Report for the Refined Metals Corporation located in Beech Grove, Indiana. Please find the enclosed Attachment describing all of the necessary revisions that must be addressed in the CMS Report. The revised CMS Report should be submitted to U.S. EPA within 30 days of receipt of this letter.

If you have any questions, I can be reached at (312) 886-7954.
Sincerely,

Jonathan Adenuga
Corrective Action Section
Enforcement Compliance Assurance Branch

cc: Rob young, Techlaw Inc.,
cc: Ruth Jean, IDEM

ATTACHMENT

1.) **Pg. 2-2, Section 2.2, Previous Investigations:** The third paragraph states that the arsenic exceedences observed in MW-3 are due to turbidity in the monitoring well. Refined should provide the nephelometric turbidity units (NTU) for all sampling events from monitoring well MW-3. Alternatively, RMC should replace monitoring well MW-3 and resample the well.

2.) **Pg. 3-2, Section 3.3, (Media Cleanup Standards) and Section 6.2 (Alternative 2: Soil Excavation):** The text states that, "Those areas not remediated concurrently with onsite cleanup will have a well defined deed restriction recorded for the property that indicates that any future development or reuse of the property must be supported by the exposure scenarios evaluated in the BHHRA or the BHHRA must be rerun for the future proposed exposure condition and cleaned to the appropriate levels." It is unclear what areas will not be remediated concurrently with the onsite cleanup. In addition, it is unclear what will be included in a well defined deed restriction. The text should be revised to identify the areas that are not going to be remediated concurrently. In addition, the text should provide details regarding what will be included in a well defined deed restriction.

The technical Considerations for the removal of 6 to 18 inches of offsite soils and sediment areas with total lead concentrations greater than the U.S. EPA residential screening level of 400mg/kg should be well defined. For example, the basis for the area and depth of the soil removal from the off-site areas; provisions for horizontal and vertical confirmation sampling of off-site soil and sediment areas; provisions for the back-filling of the off-site areas and the criteria used to determine the area and depth of off-site soil and sediment removal areas should all be provided in the Phase II CMS Report. Furthermore, the Phase II CMS Report should indicate that confirmatory soil and sediment sampling will be conducted to demonstrate that the excavation has achieved the off-site remediation goals, and that off-site areas will be filled with clean backfill. Revise the Phase II CMS Report to address the above issues.

3.) **Pg. 4-1, Section 4.2 Excavation (Alternative 2):** The text states that onsite soils above the RAL will be excavated and the resulting areas backfilled or re-graded to promote surface water drainage. We agree that all excavated areas should be backfilled or re-graded. However, excavated areas beneath the existing concrete covering must not only be backfilled, the concrete covering must also be restored to prevent infiltration of surface water that may migrate underneath and compromise the entire concrete pavement. Revise the report to address this issue.

4.) **Pg. 6-3, Section 6.2, Alternative 2: Soil Excavation:** The third paragraph states that, "The timing for remediation activities on the off-site properties will be dictated by RMC's negotiations with the property owner." Details regarding RMC's

negotiations with the property owners have not been provided in the text. Revise the text to include information regarding the negotiations with the property owners as well as contact information for the property owners (i.e., contact names, telephone numbers). In addition, a timeframe/schedule for the negotiations with the property owners should be provided with the text. This information should be provided prior to the selection and implementation of the remedy.

5.) **Pg. 6-4, Section 6.2, Alternative 2: Soil Excavation:** The fourth paragraph text states that metal debris generated from building demolition will be pressure washed to remove dust and soil. The remaining debris and rubble from the building and pavement demolition will be incorporated into the on-site containment cell. The debris and rubble propose for inclusion in the cell must not include battery casing. Revise the text to state that battery casing, wood, trash and other degradable materials generated during the demolition should be sent for off-site disposal.

6.) **Pg. 6-6, Section 6.2, Alternative 2: Soil Excavation:** The fourth paragraph states that the Best Management Practice (BMP) include sediment control features such as silt fence, vegetation cover in disturbed areas and storm water swales to convey storm water to a basin prior to discharge. However, since the existing waste water treatment system and the surface impoundment will also be demolished as indicated, the discharge of contaminated water from pressure washing and surface water runoff prior to discharge may constitute discharge of hazardous waste without a permit. The management of contaminated water from the pressure washing and surface runoff is not provided in the text. Revise the text to include information regarding how contaminated water from the pressure washing and surface runoff will be managed.

7.) **Pg. 6-15, Alternative 3A: On-site Containment Cell with Composite Cap:** The first paragraph proposes to utilize offsite soils and sediments below the 1,000 mg/kg lead screening level for onsite backfill. Based on the BHHRA approved by U.S. EPA, soils to be used for onsite backfill must not exceed the 50mg/kg lead level. Revise the text to state that only offsite soils and sediments below the 50mg/kg lead level will be utilized.

8.) **Pg. 6-17, Alternative 3A: On-site Containment Cell with Composite Cap:** The first paragraph states that, "The groundwater monitoring system will consist of four well around the perimeter of the cell. Existing well MW-9 will function as the background well and three new wells will be installed to serve as down-gradient wells." The wells will be sampled on a quarterly basis for the first year following completion of the cell and semi-annually from year two through year five. After year five, sampling will be conducted annually. Groundwater samples will be monitored in the field for pH, turbidity, temperature, ORP, and dissolved oxygen and conductivity and in the laboratory for lead and arsenic." However, the basis for the change in sampling frequency from quarterly to semi-annually to annually has not been provided. If contaminants are found during the initial quarterly sampling events, it is unclear why groundwater monitoring would be reduced to semi-annual sampling events for years two through five. Also, the text does not indicate whether

all of the existing onsite wells including well MW-1 will be maintained in addition to the three new monitoring wells to be installed. Finally, it is likely that the containment cell could create a mounding effect and as such a radial groundwater flow could emanate from the cell. Therefore, it is unclear if three wells are sufficient to monitor the radial groundwater flow from the containment cell. Revise the Phase II CMS Report to address the above issues.

ADVANCED GeoServices
Engineering for the Environment. Planning for People.™
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www.advancedgeoservices.com

January 15, 2007

2003-1046-05

Mr. Jonathan Adenuga
USEPA Region 5
Corrective Action Section
77 West Jackson Boulevard
Chicago, IL 60604-3590

RE: Response to CMS Report Comments
Refined Metals Beech Grove
IND 000 718 130

Dear Mr. Adenuga:

Presented herein are responses from Refined Metals Corporation (Refined) to comments from the United States Environmental Protection Agency (USEPA) regarding the Corrective Measures Study (CMS) for the Refined facility in Beech Grove, Indiana. The comments were contained in a USEPA letter dated November 30, 2006 and received by Refined on December 15, 2006. These responses have been prepared by Advanced GeoServices Corp. on behalf of Refined.

The USEPA letter contained comments specific to the Phase II CMS Report as revised on September 6, 2006. The USEPA cover letter indicated that the September 6, 2006 revisions made to the Phase II CMS Report may be acceptable, but requested one specific change to the Phase II CMS Report text and presented three additional issues. The Refined responses are provided herein.

USEPA COMMENTS

Comment: 1. **The response indicating that risks will be reassessed when Refined Metals has more information regarding: 1) post-remediation soil concentrations, and 2) land users interested in future development of the site is contrary to U.S. EPA's policy regarding the selection of remediation alternatives, which involves the selection of a risk-based cleanup level, based on defined future use, such as the proposed construction worker scenario. Revise Section 7.0 Recommendation for Corrective Measures Alternatives, to include the following statement: RMC is recommending Alternative 2 on the basis that the facility will be restricted to only commercial or Industrial land uses. These restrictions will be well-defined and recorded on the deed for the facility property. RMC or the new owner of the facility will propose additional evaluation and corrective action if any future redevelopment or reuse of the facility is not supported by the**

proposed construction worker scenario cleanup levels. Then the appropriate scenario and the appropriate cleanup levels should be selected at that time.

Response: The requested revision to Section 7.0 has been made and is attached.

Comment: **2.** **<u>Ensure the containment cell and cap are properly designed and constructed.</u> In order for the containment cell to function properly, all soil and sediment above Remedial Action Levels (RALs) must be placed in the cell above the water table. As noted in the Groundwater Monitoring Plan, dated January 26, 2006, the piezometric surface for the shallow perched groundwater on-site is less than five feet below ground surface. Lead concentrations as high as 288,000 ppm were found in samples collected at depths of four or more feet (CSB-10A-F). Under current conditions, it is very likely that some soils with concentrations above RALs come in contact with perched groundwater, particularly if there are seasonal fluctuations in the water table elevation. Careful design and construction planning will need to take place regarding the elevation of the containment cell to ensure that contact between groundwater and contaminated soil and sediments is prevented. The containment cell proposal does not include a groundwater monitoring system that could be used to monitor any future migration of contaminants emanating from the containment cell. Therefore, the proposal must be modified to include a series of groundwater monitoring wells around the containment cell to ensure that the containment cell is working as intended.**

Response: Statements have been added to the introductory paragraphs in Sections 6.3 and 6.4 of the Phase II CMS Report text indicating that soils situated below the water table that exceed the RAL will be excavated and backfilled with soils below the RAL. Statements have also been added that a groundwater monitoring system will be installed and operated to monitor performance of the containment cell. Specifics about the groundwater monitoring system are provided at the end of the Technical Considerations Section for Alternative 3A and 3B. The cost estimates have been revised to reflect installation and 30 years of operation of the groundwater monitoring system.

Comment: **3.** **<u>Perform corrective measures evaluation for groundwater.</u> While the proposed containment cell may address the potential for further migration of contamination from soil to groundwater if properly designed and constructed, it does not address current contamination in groundwater. We also note in your response that RMC has**

proposed to perform additional soil and/or groundwater characterization by analyzing selected soil samples for leachability using U.S. EPA Method 1312 for SPLP. There is no regulatory application of the SPLP test to RCRA corrective action investigations at Federal lead facilities. Therefore, we do not authorize the use of SPLP to be performed in lieu of groundwater sampling.

Groundwater collected from several of the monitoring wells has been shown to contain lead or arsenic concentrations above maximum contaminant levels (MCLs). Monitoring wells MW-7 and MW-8, located along the northeastern edge of the operational area have each shown progressively increasing concentrations of total lead and arsenic over the three sampling events at these wells. Monitoring wells MW-2 and MW-1, located along the northwestern edge of operations have each had four or more samples exceeding the MCL for arsenic. MW-2 also had MCL exceedances for lead in four samples. Monitoring wells MW-2D, MW-3, MW-5, and MW-6D each had one or two exceedances of the MCL for arsenic. Finally, monitoring well MW-6S had one exceedance of the MCL for lead. No exceedances have occurred in the well identified as upgradient, MW-9.

As noted in several previous U.S. EPA comments, groundwater contamination needs to be addressed through the corrective measures process. RMC should provide a corrective measures evaluation for groundwater to U.S. EPA within 30 days.

Response: The currently available geologic and hydrogeologic information is too limited to proceed directly with completion of a groundwater specific CMS. Based on Refined's telephone conversations with you on January 9, 2007, Advanced GeoServices understands the USEPA concurs with this. As agreed to during the January 9, 2007 telephone conversation with Refined, Advanced GeoServices will provide USEPA with a brief scope of work to collect additional groundwater data to support completion of a groundwater CMS. Advanced GeoServices understands that the USEPA has authorized Refined to take 60 days to collect the additional data and complete a groundwater specific CMS. After conferring with Refined, Advanced GeoServices wants to be clear that Refined understands the submittal deadline will be from the initiation of field work. The groundwater CMS will be provided as an addendum to the Phase II CMS Report.

Comment: 4. **<u>Implement remedial actions for off-site soils.</u> Appropriate remedial measures need to be implemented for off-site soils with contaminant concentrations greater than RALs. In RMC's March 16, 2006 responses to U.S. EPA comments, RMC agreed to implement land use restrictions or remedial actions to protect off-site receptors. RMC has not addressed off-site contamination in conjunction with the remedial design for on-site soil contamination. RMC should provide a plan to address contaminated off-site soils within 30 days to U.S. EPA.**

Response: The Phase II CMS Report has been modified to include remediation of off-site soils and sediment with total lead concentrations that exceed the USEPA residential soil screening level for lead (400 mg/kg). The result is excavation of approximately 15,800 cubic yards of off-site soil and sediment from excavations ranging from 6 to 18 inches deep. The cost associated with excavating and restoring these areas has been added to the cost estimate for Alternative 2. The costs for managing these soils have been added to Alternative 3A, 3B and 4.

We believe that this letter and the associated changes to the Phase II CMS Report address each of the concerns raised in the November 30, 2006 comment letter. If you have any questions, please call me at 610-840-9122.

Sincerely,

ADVANCED GEOSERVICES CORP.

Paul G. Stratman, P.E., P.G.
Senior Project Consultant

PGS:vm

Enclosures

cc: Matt Love (Refined Metals)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

May 29, 2007

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

REPLY TO THE ATTENTION OF:

Matthew A. Love
Manager-Regulatory Affairs
Exide Technologies
3000 Montrose Avenue
Reading, PA 19605

Response to Comments
Refined Metals Corporation
Corrective Measures Study report
IND 000 718 130

Dear Mr. Love:

The United States Environmental Protection Agency (U.S. EPA) has completed review of the April 9, 2007, letter and the revised Phase II Corrective Measures Study (CMS) Report for the Refined Metals Corporation (RMC) located in Beech Grove, Indiana. The U.S. EPA finds your response to comments no. 2, 4 and 7 of the April letter somewhat troubling. For example, these following statements were noted in the April 2007 letter: "Refined has been re-evaluating which alternative it wants to recommend in light of potential redevelopment opportunities for the site". "Refined is reluctant to be negotiating offsite property access for implementation of any particular remedy". "Refined anticipates it will decide soon whether or not to change the recommended alternative and will immediately notify the EPA when such a decision is made". These statements seem to covey the idea that until such time that RMC negotiates or secure economically viable re-development opportunities for the site, remedies proposed by RMC and exhaustively reviewed by U.S. EPA are non-binding. It also conveys the idea that the remediation of off-site property areas will not commence prior to any final decision on the future use of the RMC site.

Firstly, although, U.S. EPA encourages the re-development and reuse of impacted sites, RMC's desire to negotiate economically viable re-development opportunities for the site is not an evaluation criterion for determining the selection of a remedy. Secondly, based on the Baseline Human Health Risk Assessment (BHHRA) approved by U.S. EPA, RMC recommended soil excavation and construction of an on-site containment cell with a composite cap remedial alternative. In a U.S. EPA November 30, 2006, letter, we informed RMC that its recommendation may be an acceptable remedy as long as the "Worker 2 scenario in the approved BHHRA is adhered to. The U.S. EPA needs some clarification regarding RMC's most recent position reversal, that it is re-evaluating other

alternatives other than those already proposed under the approved BHHRA. It is also not clear, if these new re-development opportunities that are now being contemplated, would comport with the approved BHHRA. Finally, RMC's obligation to commence remediation of off-site property areas must not be contingent on the selection of final remedy for the RMC site. The remediation of contaminated off-site properties must move forward now. Please find in the enclosed Attachment, U.S. EPA's comments to your April 2007, letter and the revised CMS Report. The revised CMS Report should be submitted to U.S. EPA within 30 days of receipt of this letter.

If you have any questions, I can be reached at (312) 886-7954.

Sincerely,

Jonathan Adenuga
Corrective Action Section
Enforcement Compliance Assurance Branch

cc: Rob young, Techlaw Inc.,
cc: Ruth Jean, IDEM

ATTACHMENT

1. **Response to U.S. EPA Comment 1:** The response is partially adequate. Based on the NTU > 1000, MW-3 should be redeveloped or replaced. Also, revise Table 2B (Summary of Inorganic Groundwater Results) to address the "##########" nomenclature found in two Sampling Event columns.

2. **Response to U.S. EPA Comment 2:** The response does not appear adequate. According to the response, off-site areas will not be remediated until Refined approaches the adjacent property owners with a cleanup plan and a request for access. Remediation of off-site areas should not be delayed by the on-site remediation alternative selection process. Revise the Report to provide details regarding off-site soil remediation and documentation of negotiations with off-site property owners.

   In addition, language within the Report states that "off-site properties cannot be deed restricted" while language within the Response states that, "If access to perform the remediation is denied, then the deed restriction will indicate that the property has elevated lead concentrations and can only be utilized for exposure scenarios consistent with the Baseline Human Health Risk Assessment." It is unclear how Refined could apply deed restrictions to properties owned by third parties. Revise the Report to discuss how deed restrictions will be implemented on off-site areas or remove these statements.

   Response to U.S. EPA Comment 4: The response does not appear adequate. According to the response, detailed discussions with the off-site property owners will not commence until Refined, the U.S. EPA, and the Indiana Department of Environmental Management (IDEM) agree on an overall remedy for the site. The Response also states that Refined has been re-evaluating which alternative it wishes to recommend and is reluctant to communicate with off-site property owners until an alternative has been selected and approved by the U.S. EPA and IDEM. As stated in the Response to U.S. EPA Comment 2, remediation of off-site areas should not be delayed by the on-site remediation alternative selection process. In addition, it is Refine's responsibility to inform the off-site property owners of its intentions regarding off-site soil/remediation. As such, communication with off-site property owners should not be delayed. Revise the Report to provide details regarding off-site soil remediation and documentation of negotiations with off-site property owners. In addition, revise the Report to identify and more adequately describe the alternative which Refined wishes to recommend.

3. **Response to U.S. EPA Comment 5:** The response is partially adequate. The response states that "any battery casings encountered during remediation of the Site will be managed with site soils." It is understood that some battery casing fragments may be encountered during remediation and managed with site soils. However, where possible, large battery casing fragments and whole battery casing

should be sent off-site for disposal. Revise the Report to clarify that whole battery casings and large battery casing fragments will be sent off-site for disposal.

Response to U.S. EPA Comment 7: The response is partially adequate. According to the response, Refined "proposes to utilize offsite soils and sediments below the 1,000 mg/kg lead screening level for onsite backfill." However, the locations where the offsite soils will be excavated and where the soils will be placed onsite have not been provided, and rationale for the proposal to use soils containing higher lead concentrations than originally proposed for backfill should be provided. Refined should clarify where the offsite soils will be excavated and where the soils will be placed onsite. Justification should also be provided for the use of offsite soils with lead screening levels up to 1,000 mg/kg for onsite backfill.

Additional Comment

1. **Section 6.2 (Groundwater), Pages 6-28 – 6-39:** Groundwater alternatives have been evaluated in this version of the Report (and not in previous versions of the Report). This evaluation appears deficient, lacking rationale and detail. For example, the Report suggests that groundwater extraction and treatment over a five year period a viable alternative. However, soils containing lead at concentrations greater than 1,000 mg/kg will be left in place in several areas of the facility. Therefore, it is likely that infiltration of water through soils and into groundwater will continue to contaminate groundwater and that additional monitoring, and possible extraction and treatment, will be required. Also, monitored natural attenuation (MNA) is presented as a viable remedy for inorganics. However, very little site-specific detail is provided to support the MNA is indeed occurring onsite. Revise the Report to provide a more detailed evaluation for groundwater alternatives. If MNA is the recommended alternative, ensure that the factors outlined in U.S. EPA's guidance document *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites*, dated April 21, 1999 are included in this evaluation.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

November 30, 2006

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

REPLY TO THE ATTENTION OF:

Matthew A. Love
Manager-Regulatory Affairs
Exide Technologies
3000 Montrose Avenue
Reading, PA 19605

Response to Comments
Refined Metals Corporation
Corrective Measures Study report
IND 000 718 130

Dear Mr. Love:

The United States Environmental Protection Agency (U.S. EPA) has completed review of your September 6, 2006 response to our July 13, 2006 letter and attachment. The proposed soil excavation and construction of an on-site containment cell with a composite cap **may be** an acceptable remedy for the Refined Metals facility, provided that certain modification and revision to the current Corrective Measures Study (CMS) report are implemented. By this letter, the U.S. EPA is addressing the issues regarding the modification and revision of the CMS report separately in the enclosed attachment. The first part describes the necessary revisions to the CMS report prior to its approval and the second part describes the modification that must be made to the proposed remedy in the CMS report prior to its selection for proposal for public comment.

The revised CMS report should be submitted to U.S. EPA within 30 days of receipt of this letter.

If you have any questions, I can be reached at (312) 886-7954.
Sincerely,

Jonathan Adenuga
Corrective Action Section
Enforcement Compliance Assurance Branch

cc: Rob young, Techlaw Inc.,
cc: Ruth Jean, IDEM

ATTACHMENT

1. The response indicating that risks will be reassessed when Refined Metals has more information regarding: 1) post-remediation soil concentrations, and 2) land users interested in future development of the site is contrary to U.S. EPA's policy regarding the selection of remediation alternatives, which involves the selection of a risk-based cleanup level, based on defined future use, such as the proposed construction worker scenario. Revise **Section 7.0 Recommendation For Corrective Measures Alternatives,** to include the following statement: RMC is recommending Alternative 2 on the basis that the facility will be restricted to only commercial or Industrial land uses. These restrictions will be well-defined and recorded on the deed for the facility property. RMC or the new owner of the facility will propose additional evaluation and corrective action if any future redevelopment or reuse of the facility is not supported by the proposed construction worker scenario cleanup levels. Then the appropriate scenario and the appropriate cleanup levels should be selected at that time.

MODIFICATION TO THE PROPOSED ALTERNATIVE

Ensure the containment cell and cap are properly designed and constructed. In order for the containment cell to function properly, all soil and sediment above Remedial Action Levels (RALs) must be placed in the cell above the water table. As noted in the Groundwater Monitoring Plan, dated January 26, 2006, the piezometric surface for the shallow perched groundwater on-site is less than five feet below ground surface. Lead concentrations as high as 288,000 ppm were found in samples collected at depths of four or more feet (CSB-10A-F). Under current conditions, it is very likely that some soils with concentrations above RALs come in contact with perched groundwater, particularly if there are seasonal fluctuations in the water table elevation. Careful design and construction planning will need to take place regarding the elevation of the containment cell to ensure that contact between groundwater and contaminated soil and sediments is prevented. The containment cell proposal does not include a groundwater monitoring system that could be used to monitor any future migration of contaminants emanating from the containment cell. Therefore, the proposal must be modified to include a series of groundwater monitoring wells around the containment cell to ensure that the containment cell is working as intended.

Perform corrective measures evaluation for groundwater. While the proposed containment cell may address the potential for further migration of contamination from soil to groundwater if properly designed and constructed, it does not address current contamination in groundwater. We also note in your response that RMC has proposed to perform additional soil and/ or groundwater characterization by analyzing selected soil samples for leachability using U.S. EPA Method 1312 for SPLP. There is no regulatory application of the SPLP test to RCRA corrective action investigations at Federal lead facilities. Therefore, we do not authorize the use of SPLP to be performed in lieu of groundwater sampling.

Groundwater collected from several of the monitoring wells has been shown to contain lead or arsenic concentrations above maximum contaminant levels (MCLs). Monitoring wells MW-7 and MW-8, located along the northeastern edge of the operational area have each shown progressively increasing concentrations of total lead and arsenic over the three sampling events at these wells. Monitoring wells MW-2 and MW-1, located along the northwestern edge of operations have each had four or more samples exceeding the MCL for arsenic. MW-2 also had MCL exceedances for lead in four samples. Monitoring wells MW-2D, MW-3, MW-5, and MW-6D each had one or two exceedances of the MCL for arsenic. Finally, monitoring well MW-6S had one exceedance of the MCL for lead. No exceedances have occurred in the well identified as upgradient, MW-9.

As noted in several previous U.S. EPA comments, groundwater contamination needs to be addressed through the corrective measures process. RMC should provide a corrective measures evaluation for groundwater to U.S. EPA within 30 days.

Implement remedial actions for off-site soils. Appropriate remedial measures need to be implemented for off-site soils with contaminant concentrations greater than RALs. In RMC's March 16, 2006 responses to U.S. EPA comments, RMC agreed to implement land use restrictions or remedial actions to protect off-site receptors. RMC has not addressed off-site contamination in conjunction with the remedial design for on-site soil contamination. RMC should provide a plan to address contaminated off-site soils within 30 days to U.S. EPA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

July 13, 2006

REPLY TO THE ATTENTION OF:

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Matthew A. Love
Manager-Regulatory Affairs
Exide Technologies
3000 Montrose Avenue
Reading, PA 19605

Corrective Measures Study Report (phase II)
Revised May 11, 2006
Refined Metals Corporation
IND 000 718 130

Dear Mr. Love:

The United States Environmental Protection Agency (U.S. EPA) has completed review of the revised May 11, 2006, Refined Metals Corporation Phase II Corrective Measures Study Report (REPORT) dated October 21, 2005. The Area Of Contamination (AOC) concept as proposed in the revised REPORT would not address all of U.S. EPA's concerns and is not consistent with the AOC policy. Based on our review of the proposed remedial Alternatives, the current AOC policy and the remedial objectives contemplated for the facility, it appears that the Corrective Action Management Unit (CAMU) remedial option would be the more appropriate and expeditious approach. The CAMU option with some modifications allows Refined Metals to design and construct the proposed containment cell with a composite bottom liner (including geomembrane and soil liners), which is not presently included in the composite cap proposed for the cell. Therefore, we strongly recommend that Refined Metals revise the REPORT to include a proposal for a (CAMU) for the implementation of Alternative 3A. In addition, the proposed relocation of the containment cell, as illustrated in Drawing 1, appears to be adjacent to the property boundary for the facility. This may present issues, particularly since the Refined Metals fence line is shown to be located approximately 10 feet outside the property line.

Refined Metals has presented an additional evaluation of the groundwater data that exceed the maximum contaminant levels (MCLs) of the Federal primary drinking water standards for arsenic and lead. This evaluation, however, compares the filtered groundwater sample data to the MCLs, which are based on unfiltered water concentrations. Consequently, it appears that additional information is required to address the potential for transport of soil contaminants to the groundwater beneath the facility. In part, this assessment of the soil contaminant transport to groundwater will be

addressed by the design of the CAMU-required composite liner for the proposed containment cell. The enclosed attachment provides you with specific comments to the REPORT. The revised REPORT should be submitted to U.S. EPA within 30 days of receipt of this letter.

If you have any questions, I can be reached at (312) 886-7954.

Sincerely,

Jonathan Adenuga
Corrective Action Section
Enforcement Compliance Assurance Branch

cc: Rob young, Techlaw Inc.,
cc: Ruth Jean, IDEM

ATTACHMENT

1. **Comment 4:** The response indicates that risks will be reassessed when Refined Metals has more information regarding: 1) post-remediation soil concentrations, and 2) land users interested in future development of the site. This approach, however, is contrary to U.S. EPA's policy regarding the selection of remediation alternatives, which involves the selection of a risk-based cleanup level, based on defined future use, such as the proposed construction worker scenario. Based on the proposed exposure risks for the construction worker scenario, there will be significant limitations on future land use. For example, the proposed construction worker scenario will not allow for residential development in the future and will support only limited industrial development. These restrictions must be well-defined and recorded on the deed for the facility property.

   If Refined Metals anticipates that future land use is not supported by the proposed construction worker scenario cleanup levels, then the appropriate scenario should be selected at this time. Revise the Phase II CMS Report to accurately present the anticipated future land use for the site, as well as the appropriate cleanup levels to support the selection of a remediation alternative and to ensure future land users are adequately protected from unacceptable risk.

2. **Comment 8:** The U.S. EPA comments, dated April 19, 2006, requested additional information regarding the characterization and risk evaluation of groundwater beneath the site, which has arsenic and lead concentrations above the maximum contaminant levels (MCLs) of the Federal primary drinking water standards. Although Refined Metals presents additional information as requested, the last paragraph of the response states that the potential for migration of contaminants from the soil to groundwater can not be performed due to insufficient data for a quantitative analysis. Also, the response uses data for filtered groundwater samples, which U.S. EPA has previously indicated is not acceptable since the MCLs are based on unfiltered levels and, therefore, the filtered groundwater sample data can not be directly compared against the MCLs to demonstrate compliance with the primary drinking water standards.

   In addition, the change to Alternative 3A (a composite cap for an on-site soil containment cell) as the recommended corrective measure does not adequately consider the potential for further migration of arsenic and lead from the unlined containment cell to groundwater. Even though the proposed containment cell was relocated to an area proposed for excavation of contaminated soil, the transport of excavated soil from other locations across uncontaminated areas of the site triggers the corrective action management unit (CAMU) design requirements, including a liner for the containment cell. As there is no liner proposed for Alternative 3A, the response does not adequately demonstrate that the composite cap will provide ongoing containment and control of contaminants from a containment cell regulated as a CAMU.

Revise the Phase II CMS Report to fully consider the potential for transport of soil contaminants to groundwater, and include an evaluation of unfiltered groundwater sample data against the MCLs for arsenic and lead.

3. **Comment 9:** The response to Comment 9 considers Alternatives 3A and 3B, but does not discuss Alternative 4, which is also addressed by the comment. Since additional evaluation is requested for Alternative 3A by the U.S. EPA responses to Comments 8 and 13, there may be further consideration of Alternative 4 for treatment and off-site disposal of excavated soils. As necessary, provide the additional evaluation requested for Alternative 4.

4. **Comment 13:** Refined Metals has previously interpreted paragraph 41 of the Consent Decree to allow designation of a single AOC to implement corrective measures "on a Facility-wide basis." This interpretation initially included uncontaminated areas of the facility, while excluding the hazardous waste management units (HWMUs). Through discussions with U.S. EPA, Refined Metals was informed of expectations regarding the implementation of the AOC concept at the facility. Refined Metals proposed the application of the AOC concept in the response to this comment, however, the response is not consistent with U.S. EPA expectations or policy, including the October 14, 1998 U.S. EPA memorandum, entitled "Management of Remediation Waste Under RCRA," EPA530-F-98-026.

   Refined Metals proposes to excavate contaminated soils from two areas of contamination (AOCs) under Alternative 2 for consolidation in a single containment cell proposed under Alternative 3A. Refined Metals has relocated the proposed containment cell to an AOC, rather than the uncontaminated area where it was previously proposed. However, this soil consolidation process will require transport from one AOC to another AOC, across uncontaminated portions of the facility. The U.S. EPA policy, referenced above, addresses performance of *ex situ* waste management or transfer of wastes from one AOC to another; the policy requires establishment of a CAMU for these activities. Also, under this policy, U.S. EPA has determined that the containment cell must meet the requirements for a CAMU, including the design and construction of a composite liner for the cell.

   Drawing 1, Proposed Excavation Areas, dated May 11, 2006, illustrates the new location of the proposed containment cell. This new location was selected in an attempt to implement the AOC concept for Alternatives 2 and 3A. Based on this drawing, however, U.S. EPA has concerns regarding the proposed sitting of the cell. As depicted, the cell is located at the edge of the property boundary along its long western side, which may not be an adequate setback from the property boundary since the drawing indicates that fence line is located approximately 10 feet outside the property boundary. This may be a concern regarding security for the containment cell area, as well as assuring location of the containment cell on the facility. Also, the cell location must be surveyed and properly recorded on the facility deed. In addition, much of the eastern side the containment cell is depicted as being located beyond the

limits of the soil excavation area. Further, the implementation of Alternative 3A will also require the establishment of a CAMU in order to construct the eastern side of the cell in an uncontaminated portion of the site (the establishment of a CAMU is also required due to the waste transport issue discussed above).

Revise the Phase II CMS Report to address the establishment of a CAMU for the implementation of the proposed containment cell, as well as the sitting issues identified above.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

April 19, 2006

REPLY TO THE ATTENTION OF

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Matthew A. Love
Manager-Regulatory Affairs
Exide Technologies
3000 Montrose Avenue
Reading, PA 19605

Corrective Measures Study Report (phase II)
Revised March 16, 2006
Refined Metals Corporation
IND 000 718 130

Dear Mr. Love:

The United States Environmental Protection Agency (U.S. EPA) has completed review of the revised March 16, 2006, Refined Metals Corporation Phase II Corrective Measures Study Report (REPORT) dated October 21, 2005. The enclosed attachment provides you with specific comments to the revised REPORT. Where appropriate, we have provided concurrence with specific revisions that were acceptable. Please address the comments outlined in the attachment and submit the revised REPORT to U.S. EPA within 15 days of receipt of this letter.

If you have any questions, I can be reached at (312) 886-7954.
Sincerely,

Jonathan Adenuga
Corrective Action Section
Enforcement Compliance Assurance Branch

cc: Terry Uecker, Techlaw Inc.,
cc: Ruth Jean, IDEM

ATTACHMENT

1. The response considers additional remedial alternatives, as requested. The response appears to be adequate.

2. Refined Metals is discussing the establishment of land use controls with the owners of off-site properties that are discrete exposure areas with area-specific exposure assumptions addressed by the Baseline Human Health Risk Assessment (BHHRA). If the land use controls are achieved, the response appears to be adequate.

3. The response indicates the text and cost estimate were revised to address confirmatory sampling of excavated soil areas. The response appears to be adequate.

4. The response proposes deed restrictions or institutional controls prior to redevelopment of the site, which appear to be appropriate. It should be noted that the types of redevelopment may be limited based on the proposed cleanup levels. For example, cleanup levels were generated based primarily on evaluations of construction workers and trespassers. Risks would likely be unacceptable for other land uses such as commercial or residential.

5. The comment indicates that a remedial action level (RAL) was developed for lead and requests clarification regarding how the average post-remediation lead concentration is representative of site conditions and exposure areas. The response addresses site characterization data and post-excavation soil data. The response appears to be adequate.

6. The comment requests one or more drawings depicting comprehensive lead concentration data, which is addressed by Drawings 2, 3 and 4. The response appears to be adequate.

7. The comment requests clarification regarding the proposed location for the containment area, which is now addressed by a revised Drawing 1.

8. The comment requests further discussion regarding the characterization and risk evaluation of groundwater, which has arsenic and lead concentrations above the maximum contaminant levels (MCLs) of the primary drinking water standards. The response does not appear to be adequate since the CMS Report does not demonstrate that the proposed remedy is protective of human health and the environment for groundwater. The potential for further migration of arsenic and lead to groundwater and potential exposures to groundwater need to be considered, particularly since contaminated soils are proposed to be left on-site in the proposed remedy, which is an unlined containment cell. See comment # 13.

9. The comment requests evaluation of remedial alternatives to the specific standards provided in the RCRA Corrective Action Plan. Two of the standards were not

explicitly evaluated. The response indicates that the CMS Report was revised accordingly; however, only one sentence (in each case referring to Alternative 3A) was added to the evaluations of Alternatives 3A, 3B and 4. If these alternatives are to be considered further, additional evaluation based on the specified criteria should be provided. The response does not appear to be adequate as presently addressed.

10. The comment requests clarification regarding confirmatory sampling in soil excavation areas, as well as information regarding the proposed clean fill source. The CMS Report was revised to address the comment. The response appears to be adequate.

11. The comment requests clarification regarding storm water runoff management since the on-site wastewater treatment system will be closed and on-site storm water will be discharged without treatment. The response addresses Best Management Practices (BMPs) and appears to be adequate. The specifics of surface water management will need to be further evaluated in the Corrective Measures Implementation design documents. See comment # 13.

12. The comment requests clarification of Drawing 1, which was revised as requested. The response appears to be adequate.

13. Refined Metals has proposed an on-site containment cell, under two designs (Alternatives 3A and 3B), for consolidation of soils, concrete, asphalt and non-degradable demolition debris at the Beech Grove, Indiana facility. As proposed, the containment cell would have a cap, either a composite cover of geosynthetics and soil or a bituminous asphalt cover. No liner is proposed for the containment cell.

The proposed location of the containment cell is illustrated in Drawing 1 provided with the CMS Report. The proposed location is north of the main plant buildings in the "Grassy Area," which is relatively uncontaminated, i.e., the area is not proposed for soil excavation, except for excavation within the Arlington Avenue drainage ditch. Except for the sediment samples collected in the drainage ditch, the soil within the proposed containment cell location does not appear to have been sampled and can not be shown to be presently contaminated above the remedial action levels (RALs) for arsenic and lead.

Under RCRA, there appears to be three options for regulation of the containment cell, including a RCRA-permitted hazardous waste landfill, an area of contamination (AOC), or a corrective action management unit (CAMU). The Minimum Technology Requirements (MTRs) for a RCRA landfill are presented at 40 CFR §264.300, Subpart N, Landfills. The AOC and CAMU do not require design compliance with MTRs and are used for management of remediation waste. The AOC policy and CAMU rule are summarized in an October 14, 1998 U.S. EPA memorandum, entitled "Management of Remediation Waste Under RCRA," EPA530-F-98-026.

An AOC is considered a discrete area of generally dispersed contamination that is not a new point of hazardous waste generation. Wastes may be consolidated or treated *in situ*

within the AOC without triggering land disposal restrictions (LDRs) or MTRs. In order to perform *ex situ* waste management or transfer of wastes from one area of contamination to another, a CAMU must be established.

Since the proposed location for the containment cell is not an area proposed for soil excavation, it does not appear to qualify as an AOC and, consequently, should address the CAMU requirements at 40 CFR §264.552, which include design, treatment, closure and groundwater monitoring requirements. The areal configuration and liner design for the CAMU are specified at 40 CFR §264.552(e). Unless the Regional Administrator approves an alternative design, the CAMU is required to have a composite liner comprised of a flexible membrane liner (FML, or geomembrane) and a two-foot layer of soil with a hydraulic conductivity of no more than 1×10^{-7} centimeter per second (cm/sec).

The proposed containment cell (Alternatives 3A and 3B) does not provide for a bottom liner system and does not appear to comply with this specific CAMU design requirement. Also, the cap for a cell is typically of the same or equivalent design in order to have a cover hydraulic conductivity that is equal to that of the bottom composite liner. This limits the potential for the "bathtub effect" and consequent accumulation of leachate within the cell after closure. Since the CAMU design requires an FML in the bottom composite liner, the cap should be expected to have an FML as well. Alternative 3A proposes a high-density polyethylene (HDPE) geomembrane, which would meet this cap requirement; however Alternative 3B proposes a bituminous asphalt cover that is not of equivalent design to the CAMU-required composite liner.

The CMS Report recommends Alternative 3B as the containment cell design, but the asphalt cover does not adequately address the CAMU minimum design requirement. The technical review of remedial alternatives should be revised accordingly to address the CAMU design requirements. Alternatively, Refined Metals may petition the Regional Administrator with an alternate design that satisfies the requirements at 40 CFR §264.552(e)(ii).

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

January 12, 2006

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

REPLY TO THE ATTENTION OF:

Matthew A. Love
Manager-Regulatory Affairs
Exide Technologies
3000 Montrose Avenue
Reading, PA 19605

Corrective Measures Study Report (phase II)
Refined Metals Corporation
IND 000 718 130

Dear Mr. Love:

The United States Environmental Protection Agency (U.S. EPA) has completed review of the Refined Metals Corporation Phase II Corrective Measures Study Report dated October 21, 2005. We have identified several shortcomings in the Phase II CMS report as outlined in the enclosed attachment. We also note that the additional offsite sampling proposed in the June 2006 Phase I CMS report has not been performed. Please address the deficiencies outlined in the attachment and submit the revise the Phase II CMS report to U.S. EPA within 30 days of receipt of this letter.

If you have any questions, I can be reached at (312) 886-7954.
Sincerely,

Jonathan Adenuga
Corrective Action Section
Enforcement Compliance Assurance Branch

cc: Terry Uecker, Techlaw Inc.,
cc: Ruth Jean, IDEM

ATTACHMENT

1) The list of remedial alternatives considered does not appear to be complete. For example, it does not appear that in-situ technologies involving treatment (e.g., stabilization) or phytoremediation were evaluated. The screening process that was used to identify the alternatives evaluated in the Phase II CMS is not discussed. Revise the Phase II CMS to include evaluation of all reasonable technologies for remediation of metals in soil.

2) The selected remedial alternatives are not protective for off-site areas. For example, the remedial action level (RAL) for the grassy areas (on-site) is 4,954 ppm for lead. There are several soil and sediment sample locations that exceed the grassy-area RAL that are located on the Citizen Gas Property (R2SB-17A, R2SB-13A and RSB70) and in the drainage ditch along Arlington Avenue (R2SED-5A, R2SED-6A and R2SED-8A), as depicted on Figure 6-1 of the Phase II RCRA Facility Investigation Report (RFI Report), dated May 3, 2002. Table 1 also indicates that samples from R2SB29, which is located off-site in the drainage ditch north of the site, had lead concentrations as high as 15,700 ppm. These areas are not included in the proposed excavation area. Given that these properties are not owned by Refined Metals, the land use on the properties cannot be controlled by Refined Metals. This creates the potential for unacceptable human and/or ecological exposures on the off-site properties. The proposed remedy would essentially create a situation where contamination left in place off-site would be higher than the areas being remediated on-site. Revise the Phase II CMS to discuss how off-site risks are to be evaluated, what cleanup levels will be associated with these properties and what additional alternatives will be considered.

3) The evaluations of on-site containment cells are not adequate. Each of the containment cell alternatives includes "consolidating excavated soils, concrete, asphalt and non-degradable demolition debris into a designated area." However, there is no discussion of management of these materials as hazardous wastes. Given that lead concentrations of soils in the proposed excavation area were measured at over 8,000 ppm lead (and in many locations are two orders of magnitude higher), these materials will likely need to be managed as hazardous wastes. Consequently, the excavated soils could only be managed on-site for a limited period of time for activities such as stabilization prior to transport off-site. The options for capping would fall under hazardous waste regulations, which could include creation of a hazardous waste landfill or a Corrective Action Management Unit (CAMU). If a CAMU were to be created on-site, all of the regulations and guidance associated with the creation of a CAMU would need to be followed. For example, design of the CAMU would need to meet RCRA criteria for liners and caps, as specified in the amended CAMU Rule (40 CFR Parts 260, 264 and 271). Revise the Phase II CMS to include a complete evaluation of any proposed containment options using appropriate hazardous waste management regulations and guidance.

4) It is not clear how the vertical and horizontal limits of excavation were selected in all areas. It is assumed that an arbitrary excavation distance was drawn between adjacent samples that were above and below the proposed RALs. This may be appropriate for estimating costs and comparing alternatives. However, this emphasizes the need for confirmation sampling (horizontally and vertically) to ensure that soil above cleanup levels is removed in all areas. See Comment 10 regarding the need for confirmatory sampling.

5) The discussion of Alternative 2, Soil Excavation (Section 6.2) indicates that "Alternative 2 will require the demolition of several buildings including the Material Storage, Battery Breaker, Filter Press, and Wastewater Treatment Buildings and removal/closure of the Surface Impoundment." It is unclear why demolition of these structures is discussed in the Phase II CMS. Other than the Material Storage building, it does not appear that soil samples were collected beneath any structures especially the Battery Breaker Building. If these structures are to be demolished, soils in and around the buildings should be characterized for chemical contamination. Revise the Phase II CMS to provide the rationale for including the removal of all of the structures listed in Alternative 2.

6) The proposed remedial alternatives were identified based on protection of human health as described in the Construction Worker 2 scenario. However, it is not clear how all of the conditions assumed as part of this scenario will be maintained at the site. For instance, if restrictions are necessary to prevent digging below a specified depth or if a site-specific health and safety plan will be implemented to protect a construction worker receptor from exposure to contaminants in soil, these should be described as part of the remedy in the Phase II CMS. Likewise, it is not clear that the costs associated with maintaining those conditions were considered. For instance, if any of the proposed alternatives require deed restrictions or other land use controls, the associated costs should be considered in the CMS evaluation. Provide additional discussion of the institutional or land use controls necessary to maintain protectiveness over time according to assumptions for the Construction Worker 2 scenario. Include associated costs in the evaluation of the alternatives.

7) An RAL was developed for lead and is proposed as the cleanup goal at the Refined Metals site. An RAL is defined in the Phase I CMS Report as "the concentration above which soil must be removed, so that the post-remediation *average* concentration meets the specified target cleanup level. The RAL is a remedial action goal that ensures the post-remediation average concentration at a site achieves the target cleanup level with a specified level of confidence." It is further explained that the RAL was calculated assuming that excavated soil would be replaced with clean backfill containing lead at a concentration of 50 mg/kg. However, it is not clear how the average, post-remediation concentration is determined to be representative of site conditions and exposure areas. Provide additional information to support the assumption that the average post-remediation concentration is representative of site conditions and exposure areas.

8) The Phase II CMS does not include any figures or drawings depicting the distribution of lead contamination in soils at the site. This makes it difficult to determine whether the proposed alternatives are appropriate. Revise the Phase II CMS to include one or more drawings with comprehensive lead concentration data depicted.

9) The drawing in the Phase II CMS provides the proposed excavation area, but does not indicate where the proposed containment area is likely to be placed. Revise the Phase II CMS to include the projected location of the containment area.

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11) **Section 5, Evaluation Criteria, Page 5-1 through 5-3:** The RCRA Corrective Action Plan (OSWER Directive 9902.3-2A, May 1994) (CAP) identifies specific standards that are to used in evaluating the remedial alternatives. Most of these standards appear to be evaluated in the Phase II CMS. However, two of the standards do not appear to be explicitly evaluated: "Control the source of releases so as to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment" (Page 52 of the CAP) and "Reduction in the toxicity, mobility or volume of wastes" (Page 54 of the CAP). The Phase II CMS should be revised to include evaluation of each alternative with respect to these standards.

12) **Section 6.2, Alternative 2: Soil Excavation, Pages 6-3 through 6-7:** The description of the soil excavation alternative does not provide any details about confirmation sampling during the excavation process. In order to ensure that soil above cleanup levels has been removed, confirmation sampling would need to be performed throughout the excavation area, including the soils at the bottom and surface adjacent to the excavation. Similarly, it is unclear how the excavated areas would be filled. Based on the stated objective to re-use at least part of the facility, the excavated areas would need to be filled in with clean fill. In addition, no information about a possible clean fill source has been provided. Revise the

CMS Phase II to include discussion and appropriate costing information related to confirmation sampling and fill for the excavated areas.

13) **Section 6.2, Alternative 2: Soil Excavation, Page 6-3:** The description states that the wastewater treatment system will be closed and on-site storm water will be discharged from the facility directly without treatment. Given the proposed on-site RAL of 8,470 mg/kg lead, it appears that continued collection and treatment of storm water may be necessary to prevent elevated metals concentrations in discharges to surface water. Revise the CMS Phase II to describe the procedures that will be followed to ensure that runoff containing lead will not contaminate adjacent areas and impact human health or the environment. Ensure that this discussion takes into account the proposed demolition of the wastewater treatment buildings.

14) **Drawing 1, Proposed Excavation Areas:** Several of the sediment sample locations along the eastern boundary of the property are labeled to indicate zero inches are to be excavated. However, there is one label between sample locations R2SED7R and R2SED8 that appears to indicate six inches of sediments may be removed. Revise the drawing to clarify whether sediment is proposed for removal along the eastern boundary of the site. In addition, provide definitions in the legend for all symbols on the drawing.

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RZ2.R05902.11.ID.787

December 9, 2005

Mr. Allen Wojtas
U.S. Environmental Protection Agency
Region 5, DM-7J
77 West Jackson Boulevard
Chicago, IL 60604

Reference: EPA Contract No. 68-W-02-019; EPA Work Assignment No. R05902; Corrective Action Support; Refined Metals Corporation, Beech Grove, IN; EPA ID No. IND000718130; Review of the Phase II Corrective Measures Study Report, dated October 21, 2005; Task 2 Deliverable

Dear Mr. Wojtas:

Please find enclosed TechLaw's review of the Review of the Phase II Corrective Measures Study for Refined Metals Corporation (RMC) in Beech Grove, Indiana dated October 21, 2005 (Phase II CMS). For your convenience, this deliverable was also E-mailed directly to you in MS Word format.

TechLaw identified several significant technical issues in the course our technical review. These issues include:

- There are soils and sediments in off-site areas that exceed the remedial action levels (RALs). However, these areas are not addressed in the CMS.

- RMC has proposed a remedy that involves excavation of contaminated soil, debris, etc. and consolidation in an on-site containment unit. However, it has not been determined whether these materials are hazardous wastes. If they are, which is likely given the high concentrations of lead in the soils, RCRA regulations will need to be addressed for the containment unit.

- The Phase II CMS does not address the need for and costs associated with land use restrictions and institutional controls. These will be required based on the proposed RALs.

- The list of remedial alternatives presented in the Phase II CMS does not appear complete. In addition, RMC has not assessed the remedial alternatives using all the evaluation criteria identified in the RCRA Corrective Action Plan (OSWER Directive 9902.3-2A). One of these criteria, "reduction in the toxicity, mobility or volume of wastes," could have a significant impact on the selected remedy.

- The Phase II CMS describes the demolition of several structures at the site. However, there has been no sampling around/beneath several of the structures, and sampling near one of the structures (a surface impoundment) were below the proposed RALs. Therefore, it is unclear why these activities have been included in the Phase II CMS.

Based on the significance of the issues described above, TechLaw recommends that RMC revise the Phase II CMS, and U.S. EPA use the revised version of the document to prepare the Statement of Basis.

If you have any questions, please contact me at (312) 345-8966 or Ms. Kristi Hogan, TechLaw's Work Assignment Manager, at (312) 345-8963.

Sincerely,

Robert Young
Regional Project Manager

cc: F. Norling, U.S. EPA Region, w/out attachment
J. Adenuga, U.S. EPA Region 5, w/out attachment
P. Brown-Derocher/Central Files
K. Hogan
Chicago Central File

REVIEW OF THE
PHASE II CORRECTIVE MEASURES STUDY REPORT
DATED OCTOBER 21, 2005

REFINED METALS CORPORATION
BEECH GROVE, INDIANA
EPA ID No. IND00718130

Submitted to

Mr. Allen Wojtas
U.S. Environmental Protection Agency
Region 5, DM-7J
77 West Jackson Boulevard
Chicago, Illinois 60604

Submitted by:

TechLaw, Inc.
105 West Madison
Suite 900
Chicago, Illinois 60606

EPA Work Assignment No.	**R05902**
Contract No.	**68-W-02-019**
EPA WAM	**Allen Wojtas**
Telephone No.	**(312) 886-6194**
EPA Technical Advisor	**Jonathan Adenuga**
Telephone No.	**(312) 886-7954**
TechLaw WAM	**Kristi Hogan**
Telephone No.	**(312) 345-8963**

December 9, 2005

REVIEW OF THE
PHASE II CORRECTIVE MEASURES STUDY REPORT
DATED OCTOBER 21, 2005

REFINED METALS CORPORATION
BEECH GROVE, INDIANA
EPA ID NO. IND00718130

The following comments were generated based on a review of the Phase II Corrective Measures Study for Refined Metals Corporation (RMC), dated October 21, 2005 (Phase II CMS).

GENERAL COMMENTS

1. The list of remedial alternatives considered does not appear to be complete. For example, it does not appear that in-situ technologies involving treatment (e.g., stabilization) or phytoremediation were evaluated. The screening process that was used to identify the alternatives evaluated in the Phase II CMS is not discussed. Revise the Phase II CMS to include evaluation of all reasonable technologies for remediation of metals in soil.

2. The selected remedial alternatives are not protective for off-site areas. For example, the remedial action level (RAL) for the grassy areas (on-site) is 4,954 ppm for lead. There are several soil and sediment sample locations that exceed the grassy-area RAL that are located on the Citizen Gas Property (R2SB-17A, R2SB-13A and RSB70) and in the drainage ditch along Arlington Avenue (R2SED-5A, R2SED-6A and R2SED-8A), as depicted on Figure 6-1 of the Phase II RCRA Facility Investigation Report (RFI Report), dated May 3, 2002. Table 1 also indicates that samples from R2SB29, which is located off-site in the drainage ditch north of the site, had lead concentrations as high as 15,700 ppm. These areas are not included in the proposed excavation area. Given that these properties are not owned by Refined Metals, the land use on the properties cannot be controlled by Refined Metals. This creates the potential for unacceptable human and/or ecological exposures on the off-site properties. The proposed remedy would essentially create a situation where contamination left in place off-site would be higher than the areas being remediated on-site. Revise the Phase II CMS to discuss how off-site risks are to be evaluated, what cleanup levels will be associated with these properties and what additional alternatives will be considered.

See may 6, 05 cms report pgs 2-3 and pg 3-1 of cms phase II report to amend the comment

3. The evaluations of on-site containment cells are not adequate. Each of the containment cell alternatives include "consolidating excavated soils, concrete, asphalt and non-degradable demolition debris into a designated area." However, there is no discussion of management of these materials as hazardous wastes. Given that lead concentrations of soils in the proposed excavation area were measured at over 8,000 ppm lead (and in many locations are two orders of magnitude higher), these materials will likely need to be managed as hazardous wastes. Consequently, the excavated soils could only be managed on-site for a limited period of time for activities such as stabilization prior to transport off-site. The options for capping would fall under hazardous waste regulations, which could include creation of a hazardous waste landfill or a Corrective Action Management Unit

(CAMU). If a CAMU were to be created on-site, all of the regulations and guidance associated with the creation of a CAMU would need to be followed. For example, design of the CAMU would need to meet RCRA criteria for liners and caps, as specified in the amended CAMU Rule (40 CFR Parts 260, 264 and 271). Revise the Phase II CMS to include a complete evaluation of any proposed containment options using appropriate hazardous waste management regulations and guidance.

4. It is not clear how the vertical and horizontal limits of excavation were selected in all areas. It is assumed that an arbitrary excavation distance was drawn between adjacent samples that were above and below the proposed RALs. This may be appropriate for estimating costs and comparing alternatives. However, this emphasizes the need for confirmation sampling (horizontally and vertically) to ensure that soil above cleanup levels is removed in all areas. See Specific Comment 3 regarding the need for confirmatory sampling.

5. The discussion of Alternative 2, Soil Excavation (Section 6.2) indicates that "Alternative 2 will require the demolition of several buildings including the Material Storage, Battery Breaker, Filter Press, and Wastewater Treatment Buildings and removal/closure of the Surface Impoundment." It is unclear why the demolition of these structures are discussed in the Phase II CMS. It does not appear that soil samples were collected beneath any structures other than the Material Storage building. In addition, the surface impoundment is being regulated by the Indiana Department of Environmental Management. The soil samples collected adjacent to the surface impoundment were below the proposed cleanup levels. Soil samples collected from beneath the concrete liner (CSB 43-47) for the surface impoundment also contained concentrations of lead below the proposed RALs. Since the soil adjacent to and below the surface impoundment were below RALs and the soils beneath the other structures have apparently not been characterized for chemical contamination, revise the Phase II CMS to provide the rationale for including the removal of all of the structures listed in Alternative 2. If the structures will be demolished, soils in and around the buildings should be characterized for chemical contamination.

   Also, the removal of the surface impoundment and wastewater treatment buildings are potentially problematic given their purpose and the fact that they would no longer be useable. Discuss whether some or all of the structures could remain if soil beneath these structures is not found to be contaminated.

6. The proposed remedial alternatives were identified based on protection of human health as described in the Construction Worker 2 scenario. However, it is not clear how all of the conditions assumed as part of this scenario will be maintained at the site. For instance, if restrictions are necessary to prevent digging below a specified depth or if a site-specific health and safety plan will be implemented to protect a construction worker receptor from exposure to contaminants in soil, these should be described as part of the remedy in the Phase II CMS. Likewise, it is not clear that the costs associated with maintaining those conditions were considered. For instance, if any of the proposed alternatives require deed restrictions or other land use controls, the associated costs should be considered in the CMS evaluation. Provide additional discussion of the institutional or land use controls necessary to maintain protectiveness over time according to assumptions for the

Construction Worker 2 scenario. Include associated costs in the evaluation of the alternatives.

7. An RAL was developed for lead and is proposed as the cleanup goal at the Refined Metals site. An RAL is defined in the Phase I CMS Report as "the concentration above which soil must be removed, so that the post-remediation *average* concentration meets the specified target cleanup level. The RAL is a remedial action goal that ensures the post-remediation average concentration at a site achieves the target cleanup level with a specified level of confidence." It is further explained that the RAL was calculated assuming that excavated soil would be replaced with clean backfill containing lead at a concentration of 50 mg/kg. However, it is not clear how the average, post-remediation concentration is determined to be representative of site conditions and exposure areas. Provide additional information to support the assumption that the average post-remediation concentration is representative of site conditions and exposure areas.

8. The Phase II CMS does not include any figures or drawings depicting the distribution of lead contamination in soils at the site. This makes it difficult to determine whether the proposed alternatives are appropriate. Revise the Phase II CMS to include one or more drawings with comprehensive lead concentration data depicted.

9. The drawing in the Phase II CMS provides the proposed excavation area, but does not indicate where the proposed containment area is likely to be placed. Revise the Phase II CMS to include the projected location of the containment area.

SPECIFIC COMMENTS

10. **Section 2.2, Previous Investigations, Page 2-2:** The second paragraph on Page 2-2 states "The results of groundwater sampling do not show a significant impact from historic facility operations. Therefore, groundwater was not subjected to the CMS process and is not proposed for additional sampling or evaluation." According to Table 2, there are one or more monitoring wells with arsenic and lead above maximum contaminant levels (MCLs). The maximum contaminant concentrations in groundwater appear to have been in well MW-7S (290 ug/L arsenic and 217 ug/L lead). It is not clear that the potential risks associated with groundwater have been evaluated. In addition, it does not appear that the potential for future impacts to groundwater based on migration from soil have been evaluated. Revise the Phase II CMS to further discuss the characterization and risk evaluation of groundwater. If there are to be deed restrictions or other limitations placed on the use of groundwater at the facility to maintain protectiveness, this should be discussed in the Phase II CMS.

11. **Section 5, Evaluation Criteria, Page 5-1 through 5-3:** The RCRA Corrective Action Plan (OSWER Directive 9902.3-2A, May 1994) (CAP) identifies specific standards that are to used in evaluating the remedial alternatives. Most of these standards appear to be evaluated in the Phase II CMS. However, two of the standards do not appear to be explicitly evaluated: "Control the source of releases so as to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the

environment" (Page 52 of the CAP) and "Reduction in the toxicity, mobility or volume of wastes" (Page 54 of the CAP). The Phase II CMS should be revised to include evaluation of each alternative with respect to these standards.

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In addition, provide definitions in the legend for all symbols on the drawing.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

23 August 2005

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

REPLY TO THE ATTENTION OF

Matthew A. Love
Manager-Regulatory Affairs
Exide Technologies
3000 Montrose Avenue
Reading, PA 19605

Corrective Measures Study Report (phase 1)
Refined Metals Corporation
IND 000 718 130

Dear Mr. Love:

The United States Environmental Protection Agency (U.S. EPA) received your letter and attachment dated August 15, 2005 in which it was confirmed that the Refined Metals Corporation (RMC) will proceed with the Construction Worker 2 scenario post remediation at the facility. The U.S. EPA is encouraged by this and looking forward to completion of the phase 2 Corrective Measures Study (CMS). By this letter, the U.S. EPA is granting RMC final approval of the phase I CMS report. The phase 2 CMS report shall be submitted to U.S. EPA within 45 days of receipt of this letter.

If you have any questions, I can be reached at (312) 886-7954.
Sincerely,

Jonathan Adenuga
Corrective Action Section
Enforcement Compliance Assurance Branch

cc: K. Pawski-Hogan, Techlaw Inc.,
cc: Ruth Jean, IDEM

Refined Metals Corporation

August 15, 2005

Mr. Jonathan Adenuga
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, IL 60604-3590

Re: 7/19/05 EPA Comments - Corrective Measures Study Report (Phase 1)
Refined Metals Corporation
IND 000 718 130

Dear Jonathan,

I am in receipt of your letter dated July 19, 2005 providing EPA comments on the latest version of the Corrective Measures Study (CMS) Report (Phase 1). In general, the comments 1) pertain primarily to the Construction Worker 1 exposure scenario contemplated in the Human Health Risk Assessment (HHRA), 2) conclude the Construction Worker 1 scenario is unacceptable, 3) indicate the Construction Worker 2 scenario as presented in the HHRA is acceptable, 4) request Refined to commit to Preliminary Remediation Goals (PRGs) and Removal Action Levels (RALs) for the Construction Worker 2 scenario, and 5) direct Refined proceed with Phase 2 of the CMS.

As you know, the HHRA was performed in accordance with a work plan extensively reviewed and approved by the EPA resulting in what Refined believes is an appropriate and scientifically defensible HHRA. Absent a change in site considerations or EPA guidance since EPA approval of the work plan, the EPA's most recent comments appear to be an unscientific response to unanticipated PRGs and RALs resulting from implementation of the approved plan. Refined disagrees with many of EPA's comments, and in some cases found it difficult to formulate a position as the comments are occasionally confusing and contradictory. Refined's interpretation of, and a response to each EPA comment are presented in the attached memo prepared by Gradient Corporation.

In the cover letter accompanying the comments, the EPA indicates it has considered future land use in determining the appropriate future exposure scenario for the facility. As we've discussed on numerous occasions, future use of the facility is entirely up to Refined. EPA cannot dictate future land use. Refined can opt to either hold the property for an indefinite period of time in which case the Construction Worker 1 scenario would apply, or remediate the property sufficiently to allow for redevelopment in which case the Construction Worker 2 scenario would apply. Because the economics

of both options is a key component for Refined to decide its plan for the facility's future, Refined was planning to reach consensus on the HHRA for both approaches and carry both into the Phase 2 CMS for consideration.

However, Refined has decided to continue the CMS process by only applying the Construction Worker 2 scenario outputs provided EPA does not require further revision of the HHRA with regard to the Construction Worker 2 scenario assumptions, inputs, outputs, conclusions, or application of outputs as indicated in the HHRA. Should EPA choose to re-address any aspect of the Construction Worker 2 scenario (including application of PRGs and RALs), Refined may opt to revert back to the Worker 1 scenario and rely on the HHRA.

Given that we continue to disagree regarding specific aspects of the Construction Worker 1 scenario and that we propose to proceed with the Construction Worker 2 scenario under the understanding articulated above, Refined sees no current benefit in expending efforts to reach consensus regarding the Construction Worker 1 scenario so the HHRA can be revised to everyone's satisfaction. Therefore, except for the revised version of Appendix A, Page 5 which is attached, Refined proposes not to revise the HHRA. Please let me know if this is acceptable to you and I will direct my consultants to proceed with Phase 2 of the CMS.

Sincerely,

REFINED METALS CORPORATION

Matthew A. Love

Attachments

cc: Ruth Jean – IDEM (w. attach.)
Paul Stratman – AGC (w. attach.)
Terri Bowers – Gradient (w. attach.)

Memorandum

Gradient
CORPORATION

To: Matt Love **Date:** August 10, 200

From: Terri Bowers and Rosemary Mattuck

Subject: Response to July 19, 2005 EPA comments on Beech Grove CMS

Gradient has reviewed the U.S. EPA comments of July 19, 2005, on the Corrective Measures Study (CMS) Refined Metals Corporation for the Beech Grove site. Our responses to individual comments are provided below.

Attachment, General Comments

Paragraph 1: The preliminary remediation goal (PRG) for lead derived through adult lead model (ALM) applying site specific exposure conditions for all the potential receptors is in general agreement with EPA guidelines. However, EPA does not agree with the Exposure Point Concentration (EPC) used in Remedial Action Level (RAL) for lead or arsenic risk assessment calculations. The ALM recommends 0.5 acre as the exposure unit size for an industrial worker. It is understood that EPC must be representative of the average concentration to which a person would be exposed over the duration of exposure with in the recommended exposure unit. In the CMS report, the EPC calculated for RAL of lead and arsenic risk characterization for the current worker exposure scenario is diluted by combining all the data points from relatively large exposure unit size greater than 5 acres.

Response: We think this comment is objecting to the size of the exposure area (EA) rather than the EPC itself and (based on EPA General Comments, Paragraph 2) we think this comment only pertains to the Construction Worker 1 exposure scenario. The EAs are those specified in the EPA-approved Corrective Measures Study (CMS) Work Plan. We know of no changes in exposure considerations or EPA guidance since the EPA approved the work plan which would warrant re-addressing designation of EAs after the HHRA report was issued. The sizes and boundaries of EAs are based on activities expected for potential receptors, for example, construction workers who may be involved in redeveloping the site would be expected to "average their exposure" over the area over which construction would occur.

EPA's guidance for the ALM makes no recommendation about size of EAs for industrial scenarios. We think this comment has confused industrial exposure areas with the 0.5 acre recommendation for residential yards used to evaluate lead risks in young children. This would not be an appropriate assumption for this site.

The EPC is not used in the RAL calculation, although a statistical estimate of the projected post-remediation average concentration of lead is compared to the lead PRG. RAL calculations must be done for the same EAs that are assessed in the risk calculations.

Paragraph 2: With respect to the future redevelopment Construction Worker 2 Scenarios for onsite and grassy area, the exposure unit size is not restricted to 0.5 acre due to the anticipated worker exposure to the entire site. The data presented in Appendix D for post remediation arsenic risk with the PRG and RAL implemented in lead remediation Construction Worker 2 Scenario for onsite soil and grassy area soil/sediment (0-30") is acceptable to EPA. It is noticed that, the Construction Worker 2 Scenario protects the groundskeeper and site worker exposure as well in grassy area surface soil. Also, the residual contamination of lead and arsenic from this remediation is believed to be protective with respect to groundwater leaching and contamination.

Response: We think this comment says all aspects of the HHRA addressing the Construction Worker 2 scenario are acceptable to the EPA. This appears to contradict with specific comments 8 and 9.

Attachment, Specific Comments

(The 11 paragraphs are numbered and responded to here by number.)

Paragraph 1: The potential receptors, exposure pathways and exposure frequencies evaluated in Table 1, are in agreement with the Risk Assessment Guidelines. However, the exposure point concentrations listed in Table 2 for various exposure areas is a subject of discussion. The issues regarding EPC addressed briefly in general comments will be discussed further with respect to Construction Worker 1 exposure in main facility area.

Response: None.

Paragraph 2: Exposure factor input values for arsenic and lead risks and the toxicity values for these COPCs are in agreement with Risk Assessment Guidelines.

Response: None required.

Paragraph 3: The tables in Appendix A that calculate cancer and noncancer risk for ingestion of soil and/or sediment containing arsenic should be revised to accurately represent the daily intake due to ingestion. The column on daily intake is identical to the column on intake factor for cancer risk calculations.

Response: This comment should only refer to the noncancer risk calculations for ingestion of soil and/or sediment containing arsenic, on Page 5 of Appendix A. The column on daily intake is in error, although the final hazard quotient calculations are correct. We have attached a corrected page. All other tables are correct and no revisions are necessary.

Paragraph 4: RAL of 78,900 ppm of lead developed for Construction Worker 1 Scenario for onsite main facility area and the 43,400 ppm of lead in grassy area is not acceptable for the following reasons:

Response: None.

Paragraph 5: The calculation of RAL for construction worker exposure to the soil should be based on the average concentration for 0-30" soil depth rather than the stratified units. As a result of this stratification, for example in station CSB35, the contamination at 12-15" is excavated leaving 70,000 ppm of lead at 0-3" depth which is illogical. Likewise, in location CSB10, the contamination at 0-3", 6-9" and 48-51" is proposed to be excavated while leaving the contamination at 12-15" and 36-39" in place.

Response: There are two ways to calculate an RAL when faced with elevated contaminant concentrations at varying depth intervals: 1) consider each depth increment as a single sample, as we did in this HHRA, or 2) first average concentrations over depth in a given location, as EPA appears to be recommending here. There are advantages and disadvantages of each approach. Obviously, if we must excavate to a certain depth to remediate elevated concentrations, we will also be removing the soils above that depth in the same location. Although the calculation

presented in the HHRA did not include that assumption, the approach taken is a conservative approach because the resulting RAL would be higher if we had assumed removal of all soil overlying the deepest soil requiring removal and replacement of it with clean fill. The primary disadvantages with calculating a RAL on a depth-averaged basis, as recommended in this comment, are 1) confirmation sampling is best evaluated by comparing to an upper concentration limit for individual samples, rather than depth averages, and 2) areas of elevated concentration at discrete depths can be left unremediated because the depth average in the location is acceptable. For these reasons we have calculated the RAL based on individual samples.

As an additional response, we remind EPA that the onsite worker risks, which are discussed in this comment, are based on concentrations to 5 feet depth, so we're not certain why EPA would ask for the RAL to be evaluated only over the top 30 inches. The 30 inch depth is relevant only to the grassy area.

Paragraph 6: The exposure area west of the main facility building closer to the boundary is homogeneously contaminated with lead at an average concentration of 17,000 to 20,000 ppm. This area is approximately 1.6 acres in size and includes sample locations such as RSB12 and RSB54-58. If this area is considered as an individual exposure unit, worker exposure would result in 68% exceedance of target PbB level of 10 µg/dL as described in Table 7 for Construction Worker 1 Scenario. Construction Worker 1 RAL developed for lead contamination considers leaving contamination up to 78,000 ppm in place along with arsenic concentrations as high as 863 ppm which is unacceptable.

Response: The EPA approved EAs designated in the final CMS Work Plan. During extensive review of the CMS Work Plan, the EPA did not ask us to evaluate the area west of the main facility building as a separate EA. We are unsure what redevelopment or construction worker scenario EPA is envisioning that would be limited to a narrow strip close to the boundary of the property. This comment also appears to be asking for EAs that are 1.6 acres in size, contradicting general comment paragraph 1 and specific comment 7 that ask for 0.5 acre exposure areas and general comment paragraph 2 that accepts the exposure areas we evaluated in the HHRA.

The PRGs and RALs developed for the Construction Worker 1 scenario are a function of the exposure parameters presented in Table 1 and agreed to by EPA in previous correspondence as well as in this comment letter under specific comment paragraph 1. The RALs are also a function

of the number of samples within a defined exposure area and the distribution of concentrations found in those samples.

Paragraph 7: Construction Worker 1 RAL developed for lead contamination considers leaving contamination up to 78,000 ppm in place along with arsenic concentrations as high as 863 ppm which is unacceptable. Discussion with IEUBK technical support center confirms that exposure unit area for industrial worker is 0.5 acre. Derivation of PRG for lead is uniquely different from other metal contaminants due to the application of IEUBK model and for that reason, with the application of site specific conditions, any exceedance of PRG is considered a hotspot. This is mainly to prevent secondary contamination from the area of exceedances into surrounding locations and to the residential neighborhood from vehicular and foot traffic.

Response: We did not use the IEUBK model in this HHRA, nor would it be an appropriate model to use because it evaluates lead risks only in young children up to the age of 7 years. It is the case that a 0.5 acre exposure area is generally used with the IEUBK model for evaluating residential lead risks to young children, however that is irrelevant to this HHRA. The IEUBK model and its guidance manuals do not specify an exposure area size for industrial exposures, because industrial exposures to adult workers are not evaluated with the IEUBK model. We used only the Adult Lead Model in this risk assessment, and EPA's guidance for the ALM does not specify the size of the exposure area for industrial scenarios.

Although the PRG for lead is derived through blood lead models rather than cancer or noncancer risk models used for other metals, the definition of the PRG is the same for lead and other metals: the PRG corresponds to the average acceptable lead concentration over the exposure area. Both U.S. EPA's 1994 Lead Guidance Manual for the IEUBK Model (page 4-27) and the EPA's 2003 Guidance for the Adult Lead Model (pages 2, A-3, C-2) are clear about the use of average soil lead concentrations in these models and the interpretation of a lead PRG as an average. An exceedance of a PRG is not considered a hotspot; only an exceedance of an RAL is considered a hotspot (see U.S. EPA RAGs Vol. 3 Probabilistic Risk Guidance, Chapter 5). We presume that the last sentence of EPA's comment above refers to tracking of contamination from the site to other locations. If this is an exposure concern, it applies equally to all contaminants. That is, if lead were tracked off the site, arsenic would be tracked off the site at the same time. However, EPA approved the HHRA Workplan and reviewed earlier drafts of the HHRA, without asking for this exposure scenario to be included in the HHRA. Furthermore, this exposure scenario is not

addressed in EPA's Exposure Factors Handbook and it is a difficult scenario to evaluate quantitatively.

Paragraph 8: Since the policy and guidance on the description of hot spots for lead contamination is not clear, EPA analyzed the derivation of lead RAL with respect to arsenic contamination. While addressing the issue of hot spots, Teresa Bowers, the author of "Statistical Approach to Meeting Soil Cleanup Goals" in response to the comments by Edward Hanlon of EPA Region 5 noted that confidence response goal (CRG) is calculated in such a way that no single location after remediation would have a risk greater than a risk target of 1e-05. This also correlates with IDEM's risk closure level of 1e-05 for individual chemical. Following this strategy, EPA calculated the corresponding EPC to identify locations that exceeded 1e-05 cancer risk and HQ of 1.

Response:

First, EPA's guidance on risk, RALs, and the use of average lead concentrations in blood lead models is well described. Refer to the documents and pages listed in the response to comment 7.

Second, EPA misunderstands or misstates Bowers response to the Hanlon comment. The CRGs for the site described in that comment were calculated in the same manner as those presented in the HHRA for this site, based on achieving a PRG that was consistent with a cancer risk of 1×10^{-6}. The observation was made that, since most CRGs did not exceed 10 times the PRG, then no individual location would have a cancer risk associated with it greater than 1×10^{-5}. The CRGs were not calculated in this way; this was an outcome of the calculation[1].

Third, a soil contaminant concentration corresponding to IDEM's risk closure level of 1×10^{-5} cancer risk is the equivalent of what EPA terms a PRG, that is, it is the average contaminant concentration that corresponds to a 1×10^{-5} risk over an appropriate exposure area.

Finally, we believe that the last sentence of this comment is referring to EPA calculating an RAL (not an EPC) that corresponds to the concentration at an individual location consistent with a cancer risk of 1×10^{-5} or HI of 1. This is not the appropriate way to calculate an RAL, which should instead be based on achieving the PRG on average over an exposure area.

---

[1] Since the 1996 publication by Bowers and comment by Hanlon, EPA has adopted the term "remedial action level" (RAL) for what was being called a CRG at that time.

Paragraph 9: Thus for onsite area, an arsenic concentration of 123 ppm and for grassy area, arsenic concentration of 78 ppm was selected as point of compliance. If onsite Construction Worker 1 RAL for lead is implemented in corrective measures, at least 22 locations with arsenic concentrations exceeding 123 ppm will remain unaddressed.

Response: We believe EPA is suggesting that arsenic RALs of 123 mg/kg onsite and 78 mg/kg in the grassy area would be acceptable. Arsenic toxicity arises from long-term, chronic exposures, and thus consideration of exposure at individual locations is not appropriate. Table 9 of the HHRA summarizes expected post-remediation risks for arsenic after cleanup for lead and shows cancer risks below 10^{-5} and HIs below 1 for all scenarios evaluated. As a result, we did not calculate RALs for arsenic. Furthermore, this comment appears to contradict general comment paragraph 2, which states that post-remediation arsenic risks will be acceptable if the lead RALs developed for the Construction Worker 2 exposure scenario are used to define remediation.

Paragraph 10: In the interest of moving the CMS along the final remediation, EPA considered the lead RAL derived for Construction Worker Scenario 2 for onsite and grassy area rather than making Refined Metals redo the risk assessment. For the following reasons, the data submitted and the conclusions derived for Construction Worker 2 Scenario in Appendix D is acceptable to EPA.

Response: Several exposure scenarios are generally presented in a risk assessment, and multiple cleanup levels are often generated so that an appropriate scenario can be chosen as a risk management decision. The choice of one scenario or cleanup level over another is a risk management decision that does not negate the value of the risk assessment. It is appropriate to keep a record in the risk assessment of all scenarios that were considered.

Paragraph 11: The exposure point concentration derived for these areas is similar to the exposure unit size of Construction Worker 1 Scenario. However, with respect to the future redevelopment scenario, the exposure unit size becomes less restrictive and area larger than 0.5 acres is considered acceptable. The RAL derived for lead contamination in onsite for construction Worker 2 Scenario is acceptable since it addresses the contamination at the west side of the main facility close to the boundary. Data analysis with stratified depths results in similar conclusions derived from average contaminant concentration over 0-30" depth. The residual lead

contamination resulting from the projected remediation is believed to prevent the secondary contamination from areas of high contamination as well as leaching into groundwater. Except one location each in onsite and grassy area, the corresponding post remediation arsenic concentration does not exceed the excess cancer risk of 1e-5.

Response: We think this comment says that the lead RALs of 8,470 mg/kg for the onsite area and 4,954 mg/kg for the grassy area are acceptable, and the projected post-remediation arsenic risks under this remediation scenario are also acceptable.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

July 19, 2005

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

REPLY TO THE ATTENTION OF

Matthew A. Love
Manager-Regulatory Affairs
Exide Technologies
3000 Montrose Avenue
Reading, PA 19605

Corrective Measures Study Report (phase 1)
Refined Metals Corporation
IND 000 718 130

Dear Mr. Love:

In response to your May 6, 2005 letter and your subsequent submittal in response to our June conference call, the United States Environmental Protection Agency (U.S. EPA) is providing you with our final approval with comments to the phase 1 Corrective Measures Study (CMS) report. This approval is contingent upon your agreeing to proceed with the Worker **2** Scenario post remediation option as Proposed and modification of Appendix A in the phase 1 CMS report. The suggested revision to Appendix A is indicated in the enclosed attachment. In our April 2005 letter to you, the U.S EPA requested that you submit a revised phase 1 CMS report including the Base line Human Health Risk Assessment (HHRA) addressing the shortcomings noted in the CMS report. The purpose of human health risk assessment in the CMS report as outlined in Section 3 is to determine whether the designated exposure areas pose any acceptable health risks or if they require remediation to reduce risk to acceptable levels. Accordingly, PRG levels were created for lead contamination in the surface and subsurface level. Similarly, site specific risk characterization on arsenic focused specifically on cancer and non cancer health hazard.

Keeping in mind the outlined objectives in the CMS report, the current and future land use of the site, the enclosed attachment describes in detail, the risk assessor's rationale for the selection of the Worker **2** Scenario post remediation at the facility. The attachment also outlines the reasons why the Worker **1** Scenario is unacceptable for the facility. We have also included some suggestions as to how the CMS report should be revised to address all of the comments in the attachment. In addition, the facility should proceed with the proposed additional sediment sampling in the drainage ditch around the west side of the citizen's gas property. You are required to submit a letter to U.S. EPA affirming that the Worker **2** Scenario post remediation option would be carried through in the second phase II CMS at the facility. This letter should be submitted to U.S. EPA no

no later than August 15, 2005. If any, all appropriately revised pages should also be submitted for incorporation into the phase 1 CMS report.

If you have any questions, I can be reached at (312) 886-7954.

Sincerely,

Jonathan Adenuga
Corrective Action Section
Enforcement Compliance Assurance Branch

cc: K. Pawski-Hogan, Techlaw Inc.,
cc: Ruth Jean, IDEM

ATTACHMENT

General Comments

The preliminary remediation goal (PRG) for lead derived through adult lead model (ALM) applying site specific exposure conditions for all the potential receptors is in general agreement with EPA guidelines. However, EPA does not agree with the Exposure Point Concentration (EPC) used in Remedial Action Level (RAL) for lead or arsenic risk assessment calculations. The ALM recommends 0.5 acre as the exposure unit size for an industrial worker. It is understood that EPC must be representative of the average concentration to which a person would be exposed over the duration of exposure with in the recommended exposure unit. In the CMS report, the EPC calculated for RAL of lead and arsenic risk characterization for the current worker exposure scenario is diluted by combining all the data points from relatively large exposure unit size greater than 5 acres.

With respect to the future redevelopment construction Worker **2** Scenarios for onsite and grassy area, the exposure unit size is not restricted to 0.5 acre due to the anticipated worker exposure to the entire site. The data presented in Appendix D for post remediation arsenic risk with the PRG and RAL implemented in lead remediation construction Worker **2** Scenario for onsite soil and grassy area soil/sediment (0-30") is acceptable to EPA. It is noticed that, the construction Worker 2 Scenario protects the groundskeeper and site worker exposure as well in grassy area surface soil. Also, the residual contamination of lead and arsenic from this remediation is believed to be protective with respect to groundwater leaching and contamination.

Specific Comments

The potential receptors, exposure pathways and exposure frequencies evaluated in Table 1, are in agreement with the Risk Assessment Guidelines. However, the exposure point concentrations listed in Table 2 for various exposure areas is a subject of discussion. The issues regarding EPC addressed briefly in general comments will be discussed further with respect to construction Worker **1** exposure in main facility area.

Exposure factor input values for arsenic and lead risks and the toxicity values for these COPCs are in agreement with Risk Assessment Guidelines.

The tables in appendix A that calculate cancer and non cancer risk for ingestion of soil and /or sediment containing arsenic should be revised to accurately represent the daily intake due to ingestion. The column on daily intake is identical to the column on intake factor for cancer risk calculations.

RAL of 78, 900 ppm of lead developed for Construction Worker **1** Scenario for onsite main facility area and the 43,300 ppm of lead in grassy area is not acceptable for the following reasons:

Thus for onsite area, an arsenic concentration of 123 ppm and for grassy area, arsenic concentration of 78 ppm was selected as point of compliance. If onsite construction worker **1** RAL for lead is implemented in corrective measures, at least 22 locations with arsenic concentrations exceeding 123 ppm will remain unaddressed.

In the interest of moving the CMS along the final remediation, EPA considered the lead RAL derived for construction Worker Scenario **2** for onsite and grassy area rather than making Refined Metals redo the risk assessment. For the following reasons, the data submitted and the conclusions derived for construction Worker **2** Scenario in Appendix D is acceptable to EPA:

The exposure point concentration derived for these areas is similar to the exposure unit size of construction Worker **1** Scenario. However, with respect to the future redevelopment scenario, the exposure unit size becomes less restrictive and area larger than 0.5 acres is considered acceptable. The RAL derived for lead contamination in onsite for construction Worker **2** Scenario is acceptable since it addresses the contamination at the west side of the main facility close to the boundary. Data analysis with stratified depths results in similar conclusions derived from averaging contaminant concentration over 0-30" depth. The residual lead contamination resulting from the projected remediation is believed to prevent the secondary contamination from areas of high contamination as well as leaching in to groundwater. Except one location each in onsite and grassy area, the corresponding post remediation arsenic concentration does not exceed the excess cancer risk of 1e-5.

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May 6, 2005 2003-1046-02

Mr. Jonathan Adenuga
Corrective Action Branch
Environmental Protection Agency, Region 5
77 West Jackson Boulevard
Chicago, IL 60604-3590

RE: Response to Additional EPA Comments on CMS Report
Refined Metals Facility
Beech Grove, Indiana
IND 000 718 130

Dear Jonathan:

In response to communications between the EPA and Refined representatives since Advanced GeoServices Corp. (AGC) issued the last response to EPA comments on February 22, 2005, this letter and the enclosed revised Corrective Measures Study (CMS) Report have been prepared. Except for potential incorporation of soil data from locations to the north, northeast and south of the facility, and sampling results of lagoon sediments, all issues discussed since AGC's last response letter have been incorporated into the revised CMS Report.

Regarding soil data not incorporated into the CMS Report, 11 soil borings have been completed on commercial properties north of the facility across the railroad tracks, eight have been completed on residential properties northeast of the property across South Arlington Avenue, and four have been completed on a commercial property south of Big Four Road. Two soil samples (0-3" and 3-10") were collected from each of these borings. Arsenic concentrations in four samples from the 3-10" depth interval on the commercial properties to the north slightly exceeded the calculated background concentration of 7.91 ppm, ranging from 8 to 9.7 ppm. Lead was detected at 422 ppm in one sample from the 0-3" interval on the residential properties to the northeast, slightly exceeding the PRG of 400 ppm. Arsenic was detected at 8.1 ppm in one sample from the 3-10" depth interval on the commercial property to the south, slightly exceeding the calculated background concentration of 7.91 ppm. The remainder of the soil samples from these three areas was below applicable background and PRG concentrations. Based on these results, these three areas and associated data were not included in the CMS.

The EPA had inquired whether samples from 1999 with a CSED designation (e.g. CSED-1A, etc.) were included in the risk assessment. This series of samples represents sediments from the bottom of the lagoon. Since these sediments will be removed under any remediation scenario, they have not been incorporated into the risk assessment.

In response to EPA comments, several revisions have been made to the Baseline Human Risk Assessment (BHRA). These changes consist primarily of the following:

- Addition of a separate exposure area and receptor for the drainage ditch along Arlington Avenue.
- Addition of a separate exposure area and receptor for the onsite drainage ditch.
- Addition of a separate exposure area and receptor for the drainage ditch along the railroad track to the north.
- Addition of a new construction worker receptor that assumes widescale redevelopment of the facility rather than ongoing O&M as contemplated with the current construction worker receptor.
- Incorporation of changes to exposure parameters as agreed to by EPA.

As we discussed, the BHRA now contemplates two options for future disposition of the facility: 1) refined holding the facility and soil disturbance limited to that necessary to maintain current conditions (construction worker 1), **OR** 2) refined selling the facility for widescale excavation and redevelopment (construction worker 2). Both options will be carried through to the second phase of the CMS so Refined can evaluate both options and select one for implementation. Of course, various remediation approaches for the selected option will be contemplated in the Phase II CMS Report for EPA review.

Sincerely,

ADVANCED GEOSERVICES CORP.

Paul G. Stratman, P.E., P.G.
Senior Project Consultant

PGS:vm

Enclosures

cc: M. Love, Exide
R. Jean, IDEM
T. Bowers, Gradient

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF: **DE-9J**

April 20, 2005

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Matthew A. Love
Manager-Regulatory Affairs
Exide Technologies
3000 Montrose Avenue
Reading, PA 19605

Corrective Measures Study Report (phase 1)
Refined Metals Corporation
IND 000 718 130

Dear Mr. Love:

The United States Environmental Protection Agency (U.S. EPA) has completed the reviews of the February 22, 2005 and the April 5, 2005 electronic responses to the January 18, 2005 U.S. EPA comments to the October 12, 2004, Corrective Measures Study (Phase 1) Report for the Refined Metals Corporation facility. The exposure parameters outlined in the Baseline Human Health Risk Assessment(HHRA) report are acceptable. We are also satisfied with your response to the unresolved groundwater issues at the facility. You are required to submit a revised CMS phase 1 report including the Baseline HHRA that address all of the issues agreed upon by both parties. The revised report shall be submitted no later than May 6, 2005, for review and approval by the U.S. EPA.

If you have any questions, I can be reached at (312) 886-7954.

Sincerely,

Jonathan Adenuga
Corrective Action Section
Enforcement Compliance Assurance Branch

cc: K. Pawski-Hogan, Techlaw Inc.,
cc: Ruth Jean, IDEM

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February 22, 2005 2003-1046-01

Mr. Jonathan Adenuga
Corrective Action Branch
Environmental Protection Agency, Region 5
77 West Jackson Boulevard
Chicago, IL 60604-3590

RE: Response to EPA's Comments for CMS Report
Refined Metals Facility
Beech Grove, Indiana
IND 000 718 130

Dear Jonathan:

Presented herein is a written response to comments from the United States Environmental Protection Agency (USEPA) on the Phase 1 Corrective Measures Study for the Refined Metals Corporation (RMC) Site in Beech Grove, Indiana. This response has been prepared by Advanced GeoServices Corp (AGC) on behalf of RMC. To facilitate your review we have provided the responses in the same order that they were presented in the attachment to your letter.

Cover Letter

Comment: **"We note in your response that you are waiting for an approval from IDEM to install the proposed MW-12. We believe that if RMC should properly install this new monitoring well prior to obtaining an approval from IDEM with all data accurately presented, the U.S. EPA would not consider this proactive effort as unreasonable since both parties agree that groundwater information retrieved from this new well could help to resolve the outstanding groundwater data dispute."**

Response: On February 14, 2005, IDEM issued a letter approving the proposed installation of MW-12. MW-12 will be installed as soon as consultant and contractor contracts can be prepared and executed, necessary permits are acquired, and consultant and contractor schedules can be coordinated. It is anticipated MW-12 can be installed by April 15, 2005. While installation of MW-12 has been approved by IDEM, an agreement regarding analytical parameters for the proposed groundwater monitoring program (including those for MW-12) has not been reached. Until an agreement is reached with IDEM regarding analytical parameters, data collected from MW-12 will be limited to groundwater depth measurements which should add certainty regarding groundwater flow patterns.

Corrective Measures Study

1. **Section 2.0, Field Activities, Page 2-1**

Comment: **The sampling date cited in the report is incorrect and must be corrected.**

Response: Project documentation indicates that groundwater samples were collected in 2003, rather than 2004 as stated. Page 2-1 of the CMS Report will be revised accordingly by issuing a replacement page for insertion into previously issued copies.

2. **Attachment 1, Appendix B**

Comment: **The jump in turbidity and dissolved oxygen readings on the last recorded entry for the field parameters measured during low flow sampling raise concern about the representativeness of the groundwater sample.**

Response: AGC discussed sampling procedures with field personnel and reviewed the field book. Low flow sampling techniques were used to collect the samples. The pump was connected to the low flow cell and the well was purged at flow rates between 120 and 200 ml/min, while field readings for pH, conductivity, dissolved oxygen (D.O.), ORP, temperature and turbidity were recorded. After the field readings stabilized for at least 3 consecutive readings, the sample was collected by disconnecting the inflow line from the flow through cell and filling all the sample containers except the containers for the filtered sample. After collection of the unfiltered samples, the inflow line was attached to the field filter. To force the water through the field filter, it was usually necessary to increase the head on the pump. After sampling, the inflow line was re-attached to the flow through cell and then the final results recorded

We believe that the increase in field readings between the second to last and the last readings is the result of the increase in pumping head during the field filtering process and water sitting in the flow through cell during the sampling event (e.g., oxygen content of water in the flow through cell could increase while the cell was temporarily disconnected to collect the filtered sample and the increased rate of flow through the cell after the pump was reconnected could re-suspend any solids that may have settled while the cell was temporarily disconnected, etc.). For these reasons, we believe that the groundwater samples are representative of groundwater conditions and appropriate for use in the RCRA Corrective Action activities. It should be noted that the jump in DO and turbidity after the collection of filtered samples has been noted on other projects and has resulted in a change in the standard operating procedures followed by AGC during low flow sampling.

Under the new procedures, a final reading of field measurement is no longer taken after flow through the cell has ceased.

3. Section 4.2.2, Sediment Sampling Results:

Comment: Provide rationale to support how soil cleanup levels derived in the HHRA can be applied to the sediment sampling results.

Response: For the purposes of evaluation and cleanup, the "sediment" in the drainage ditches sampled to date should be considered soil rather than sediment. The drainage ditches are intermittent stormwater swales that are only inundated during periods of precipitation and are not inundated most of the time. Drainage ditches onsite are grass covered and mowed along with grass in immediately surrounding soil areas. Drainage ditches along the railroad are a combination of stone ballast and/or grass and weeds. Addressing sediments in these ditches as soil would be consistent with the most recent draft EPA guidance regarding contaminated sediment remediation which specifically excludes sediments from roadside ditches. For onsite ditches, RMC proposes to apply soil standards of immediately surrounding areas. RMC proposes to discuss appropriate method for determining cleanup goals for offsite ditches with the EPA during our next meeting.

4. Section 5.0 Summary

Comment: If additional sediment sampling is being proposed to refine delineation, then additional sampling should be proposed between R2SB29 and R2SB30.

Response: The additional sediment sampling will extend along a drainage ditch that begins between sample locations RS2B26 and RS2B27 and extends onto the Citizens Gas property. The delineation provided by RS2B29 and RD2B30 is sufficient for performing the CMS.

Baseline Human Health Risk Assessment

3.1 Potential Receptors and Exposure Pathways

Comment: The grassy area should include a future construction worker scenario.

Response: At EPA's request, we have included a construction worker in the grassy area. We have utilized the same frequency and duration for exposure that was used for the construction worker on the main facility. Attached for your reference is a modified version of Table 7 *Summary of Lead Risks and Cleanup Goals* from the Risk Assessment Report. As shown, the PRG calculated for the Construction

Worker in the Grassy Area is higher than for the Worker. The Risk Assessment Report will be updated following the next meeting with USEPA.

Comment: **Provide justification for using 144 days for the future site worker in the grassy area.**

Response: The exposure scenario for the future worker in the grassy area included a worker visiting the grassy area occasionally to go for a walk or to eat lunch outside. We assumed a scenario where the worker might visit this area 4 days/week for 36 weeks/year. Assuming that a worker visits this area for 9 months/year (March to November) is supported by the average monthly temperatures for Beech Grove, Indiana (see Table 1). In contrast, we assumed an occupational scenario for a worker at the offsite natural gas facility who performs his daily work activities outside.

Table 1
Average Monthly Temperatures
Beech Grove, Indiana

Month	Mean	Avg. High	Avg. Low
Jan	26°F	33°F	18°F
Feb	30°F	39°F	22°F
Mar	40°F	50°F	31°F
Apr	51°F	61°F	41°F
May	62°F	72°F	52°F
Jun	71°F	81°F	61°F
Jul	75°F	84°F	65°F
Aug	73°F	82°F	63°F
Sep	66°F	76°F	55°F
Oct	54°F	65°F	43°F
Nov	42°F	51°F	34°F
Dec	31°F	39°F	23°F

Source: http://www.weather.com

3.2 Exposure Point Concentration

Comment: **Please verify if data gathered from closure plan sample locations as depicted in Figure 4-3 and inorganic data summary table in the Phase I RFI report have been included in the onsite data for the HHRA.**

Response: AGC reviewed the list of data points used by Gradient during completion of the HHRA. Based on that review, all of the data relevant to the HHRA for the exposure areas being evaluated has been included. The data excluded from the HHRA were sediment samples from the railroad right-of-way (R2SB25 thru R2SB30), residential samples (R2SB32 thru R2SB50), soil samples from south of Big Four Road (RSB65 thru RSB68), soil samples south and west of the Citizens Gas property (R2SB51 and R2SB53), lagoon sediment samples, dust samples and groundwater samples. Sediment samples from within the lagoon were not included because the lagoon will be cleaned out as part of future Site closure activities. The residential samples and remaining samples identified above were excluded because they were from areas outside the HHRA study area. As indicated in the response to EPA comments regarding Section 4.2.2, RMC proposes to discuss an appropriate method for determining cleanup goals for the offsite ditches during the next meeting with the EPA.

Comment: EPCs for onsite and offsite sediment contamination should be calculated separately and not pooled with soil data.

Response: As discussed in the response to EPA comments on section 4.2.2 of the Corrective Measures Study Report, sediments in drainage ditches are more appropriately addressed as soils. Consequently, sediment and soil data were combined for the risk assessment as these sediments have the same exposure potential as surrounding soils.

Comment: Provide details to show how the EPCs for arsenic were obtained. Provide all sample data by exposure area. It is not clear how the RAL was obtained based on the PRG.

Response: The EPC calculations for arsenic, and a table of the sample data by exposure area are attached to this letter.

According to U.S. EPA guidance, a risk-based cleanup is achieved when the post-remediation average concentration meets the risk-based cleanup level. The goal is to calculate a RAL so that the post-remediation average concentration will achieve the risk-based target cleanup level (the PRG) with a specified level of confidence. Gradient uses a Confidence Removal Goal (CRG) algorithm (Bowers *et al.* 1996)[1] to determine the RAL. The algorithm has been coded into a computer program which runs in Visual Basic. The CRG algorithm accounts for the inherent uncertainty in characterizing the soil concentration and calculates the RAL so that there is a 95% certainty that the average of the post-remediation data (plus the clean

[1] Bowers, TS; Shifrin, NS; Murphy, BL. 1996. "Statistical approach to meeting soil cleanup goals." *Environ. Sci. Technol.* 30 (5) :1437-1444.

replacement fill) will be less than or equal to the PRG. Once concurrence is reached regarding an appropriate PRG, an Excel table can be provided that shows the sample locations that will be subject to remediation, and show that after removal of these samples, and replacement with clean fill, the average of the post-remedial data points is less than (not equivalent to) the PRG.

5.4 Lead Risk Assessment, Table 6, Adult Lead Model Input Values

Comment: **For baseline blood lead levels, use a GM blood lead level of 1.53, and a GSD of 2.18, based on values for the Midwest from Phases 1 and 2 of NHANES-III.**

Response: The values cited from these data sets are old (Phase 1 was 1988-1991, and Phase 2 was 1991-1994), considering much more recent data are available, Gradient used the national data from the most recent NHANES survey, NHANES-2000 (1999-2000) to derive a baseline GM (1.2 µg/dL) and GSD (1.8) for women of childbearing age (Age 20 to 49). The NHANES-2000 data are not coded by region of the country. Since blood lead levels have continued to decline in the U.S. over the past decade, we believe it is more relevant to use the most recent data than it is to use the older regional data specific to the Midwest. It is important to note that, historically, the Midwest region has had the lowest blood lead levels. Therefore, the use of recent national data is conservative because the national GM blood lead level is likely slightly higher than the GM blood lead level for the Midwest region alone.

Comment: **EPA states that a PRG of 1,100 mg/kg is acceptable as "the target lead concentration for the current and future nonresidential/industrial land use at the main facility area, grassy areas, and the offsite Natural Gas facility."**

Response: Pending discussions with the EPA regarding, among other things: 1) appropriate Adult lead model input values (see response to the previous comment); 2) procedures to develop an appropriate RAL from an agreed PRG (see response to EPA comments regarding Section 3.2); 3) deviations from the EPA-approved work plan; and 4) development and application of an appropriate subsurface standard for the grassy area, RMC does not agree that the PRG referenced is appropriate for any or all of the areas referenced.

5.4 Lead Risk Assessment, Table 7, Summary of Lead Risks and Cleanup Goals

Comment: **The exposure scenario described for the onsite construction worker can not be used to derive a meaningful action level/remediation goal for construction workers, because the exposure duration is less than 90 days. EPA notes the**

Adult Lead Model guidance states that the shortest time period for application of the model is 90 days.

Response: The construction worker scenario is 50 days/year for 5 years. The CMS Work Plan states that the construction worker would be engaged in activities such as excavation for foundations or earthwork. There are no major plans to redevelop the main facility area, thus the construction work was for short-term projects taking place throughout the year, for a total of 50 days/year, rather than for projects conducted in ten consecutive 5-day weeks. For this reason, the averaging time of 365 days/year is appropriate for the construction worker. This is consistent with the Adult Lead Model guidance dated January 2003. This approach is also consistent with the evaluation of the arsenic risks. The onsite construction worker is exposed to soil depths of 0 to 5 feet; therefore, it is appropriate to develop a remedial action level for exposure to subsurface soil based on this receptor.

Please note that in Table 3, the noncancer averaging time should say 1825 days, not 365 days. This was a typographical error and does not change the results of the arsenic noncancer risks.

This summarizes RMC's anticipated response to the USEPA comments on the Phase I CMS Report. If the proposed changes/corrections are acceptable, RMC will make the changes and provide the revised information as an addendum to the Phase I CMS Report.

If you have any questions, please contact Paul Stratman at 610-840-9122 or Matthew Love at 610-921-4054.

Sincerely,

ADVANCED GEOSERVICES CORP.

Paul G. Stratman, P.E., P.G.
Senior Project Consultant

PGS:vm

cc: Ruth Jean
Matthew Love
Terri Bowers

Table 7 - Revised
Summary of Lead Risks and Cleanup Goals

Exposure Variable	PbB Equation[1] 1*	2**	Description of Exposure Variable	Units	Soil Exposure Depth	0-5 ft	0-5 ft	0-6"	0-6"	0-6"	0-30"	0-6"
						Values for Non-Residential Exposure Scenario						
						Onsite		Grassy Area			Grassy	Offsite Gas Facility
						Construction Worker	Utility Worker	Grounds-keeper	Trespasser	Worker	Construction Worker	Worker
PbS	X	X	Soil lead concentration	ug/g or ppm		20,266	20,266	15,916	15,916	15,916	9,945	1311
$R_{fetal/maternal}$	X	X	Fetal/maternal PbB ratio	--		0.9	0.9	0.9	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day		0.4	0.4	0.4	0.4	0.4	0.4	0.4
GSD_i	X	X	Geometric standard deviation PbB	--		1.8	1.8	1.8	1.8	1.8	1.8	1.8
PbB_0	X	X	Baseline PbB	ug/dL		1.2	1.2	1.2	1.1	1.2	1.2	1.2
IR_S	X		Soil ingestion rate (including soil-derived indoor dust)	g/day		0.100	0.100	0.050	0.050	0.050	0.100	0.050
IR_{S+D}		X	Total ingestion rate of outdoor soil and indoor dust	g/day		--	--	--	--	--	--	--
W_S		X	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--		--	--	--	--	--	--	--
K_{SD}		X	Mass fraction of soil in dust	--		--	--	--	--	--	--	--
$AF_{S,D}$	X	X	Absorption fraction (same for soil and dust)	--		0.12	0.12	0.12	0.12	0.12	0.12	0.12
$EF_{S,D}$	X	X	Exposure frequency (same for soil and dust)	days/yr		50	10	50	25	144	50	250
$AT_{S,D}$	X	X	Averaging time (same for soil and dust)	days/yr		365	365	365	365	365	365	365
PbB_{adult}	PbB of adult worker, geometric mean			ug/dL		15	3.9	6.4	3.7	16	8	3.4
$PbB_{fetal,0.95}$	95th percentile PbB among fetuses of adult workers			ug/dL		34	9.1	15	8.8	39	18	7.9
PbB_t	Target PbB level of concern (e.g., 10 ug/dL)			ug/dL		10.0	10.0	10.0	10.0	10.0	10.0	10.0
$P(PbB_{fetal} > PbB_t)$	Probability that fetal PbB > PbB_t, assuming lognormal distribution			%		68%	4%	18%	3%	4%	27%	2%
PRG	Preliminary Remediation Goal (PRG)			ppm		4601	23003	9201	19011	3195	4601	1840
	Clean Fill (assumed)			ppm		50				50	50	
	Remedial Action Level (RAL)			ppm		78,900				16,700	54,650	

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Arsenic EPC - Onsite Main Facility Area (0 - 5 ft)

Summary Statistics for	Site- avg
Number of Samples	97
Minimum	4.8
Maximum	1111.3
Mean	82.4
Median	13.0
Standard Deviation	165.2
Variance	27306.7
Coefficient of Variation	2.0
Skewness	3.8
95 % UCL (Assuming Normal Data)	
Student's-t	110.3
95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	117.0
Modified-t	111.3
95 % Non-parametric UCL	
CLT	110.0
Jackknife	110.3
Standard Bootstrap	110.1
Bootstrap-t	123.2
Chebyshev (Mean, Std)	155.5

Summary Statistics for	ln(Site- avg)
Minimum	1.6
Maximum	7.0
Mean	3.2
Standard Deviation	1.4
Variance	2.1
Lilliefors Test Statisitic	0.2
Lilliefors 5% Critical Value	0.1
Data not Lognormal at 5% Significance Level	
Data not Normal: Try Non-parametric UCL	
Estimates Assuming Lognormal Distribution	
MLE Mean	68.6
MLE Standard Deviation	181.4
MLE Coefficient of Variation	2.6
MLE Skewness	26.5
MLE Median	24.2
MLE 80% Quantile	82.0
MLE 90% Quantile	154.6
MLE 95% Quantile	259.8
MLE 99% Quantile	693.7
MVU Estimate of Median	24.0
MVU Estimate of Mean	67.1
MVU Estimate of Std. Dev.	162.7
MVU Estimate of SE of Mean	13.4
UCL Assuming Lognormal Distribution	
95% H-UCL	101.4
95% Chebyshev (MVUE) UCL	125.5
99% Chebyshev (MVUE) UCL	200.3

Note: Data are averaged by boring location first, before being run in the ProUCL program.

Arsenic EPC - Grassy Area, 0-6 inches

Summary Statistics for	Grassy
Number of Samples	57
Minimum	3.9
Maximum	2300.0
Mean	123.7
Median	15.0
Standard Deviation	360.1
Variance	129651.3
Coefficient of Variation	2.9
Skewness	4.8

95 % UCL (Assuming Normal Data)

Student's-t	203.5

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	234.4
Modified-t	208.5

95 % Non-parametric UCL

CLT	202.2
Jackknife	203.5
Standard Bootstrap	201.4
Bootstrap-t	311.8 ✓
Chebyshev (Mean, Std)	331.6

Summary Statistics for	ln(Grassy)
Minimum	1.3609766
Maximum	7.7
Mean	3.3
Standard Deviation	1.4
Variance	2.0
Lilliefors Test Statisitic	0.2
Lilliefors 5% Critical Value	0.1

Data not Lognormal at 5% Significance Level
Data not Normal: Try Non-parametric UCL

Estimates Assuming Lognormal Distribution

MLE Mean	73.9
MLE Standard Deviation	191.2
MLE Coefficient of Variation	2.6
MLE Skewness	25.1
MLE Median	26.6
MLE 80% Quantile	89.0
MLE 90% Quantile	166.9
MLE 95% Quantile	279.2
MLE 99% Quantile	738.6
MVU Estimate of Median	26.1
MVU Estimate of Mean	71.4
MVU Estimate of Std. Dev.	161.5
MVU Estimate of SE of Mean	17.8

UCL Assuming Lognormal Distribution

95% H-UCL	125.1
95% Chebyshev (MVUE) UCL	148.9
99% Chebyshev (MVUE) UCL	248.5

Arsenic EPC - Offsite 0-6 inches

Summary Statistics for	**Offsite**
Number of Samples	37
Minimum	3.1
Maximum	141
Mean	22.1
Median	13
Standard Deviation	24.9
Variance	622.1
Coefficient of Variation	1.1
Skewness	3.3

95 % UCL (Assuming Normal Data)	
Student's-t	29.1

95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	31.3
Modified-t	29.4

95 % Non-parametric UCL	
CLT	28.9
Jackknife	29.1
Standard Bootstrap	28.7
Bootstrap-t	33.5
Chebyshev (Mean, Std)	40.0

Summary Statistics for	**ln(Offsite)**
Minimum	1.13
Maximum	4.95
Mean	2.73
Standard Deviation	0.80
Variance	0.65
Shapiro-Wilk Test Statisitic	0.96
Shapiro-Wilk 5% Critical Value	0.94

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution	
MLE Mean	21.3
MLE Standard Deviation	20.3
MLE Coefficient of Variation	1.0
MLE Skewness	3.7
MLE Median	15.4
MLE 80% Quantile	30.4
MLE 90% Quantile	43.3
MLE 95% Quantile	57.8
MLE 99% Quantile	100.0
MVU Estimate of Median	15.3
MVU Estimate of Mean	21.0
MVU Estimate of Std. Dev.	19.3
MVU Estimate of SE of Mean	3.1

UCL Assuming Lognormal Distribution	
95% H-UCL	28.5
95% Chebyshev (MVUE) UCL	34.5
99% Chebyshev (MVUE) UCL	51.8

Recommended UCL to use:
H-UCL

Raw Data Used in Risk Assessment

Exposure Area	MATRIX	Station	SAMPLE ID	DEPTH	Arsenic (mg/kg)	Lead (mg/kg)
Site	SOIL	CSB1	CSB1A	0-3"	406	139000
Site	SOIL	CSB1	CSB-1A-A	0-3"	3.2	903
Site	SOIL	CSB1	CSB-1A-B	6-9"	1.5	18
Site	SOIL	CSB1	CSB-1A-C	12-15"	1.5	44
Site	SOIL	CSB1	CSB-1A-D	24-27"	989	249000
Site	SOIL	CSB1	CSB-1A-E	36-39"	6.8	847
Site	SOIL	CSB1	CSB-1A-F	48-51"	8.5	170
Site	SOIL	CSB1	CSB1B	6-9"	599	268000
Site	SOIL	CSB1	CSB1C	12-15"	8	511
Site	SOIL	CSB-10	CSB10A	0-3"	709	132000
Site	SOIL	CSB-10	CSB-10A-A	0-3"	4.5	1780
Site	SOIL	CSB-10	CSB-10A-B	6-9"	6.1	1210
Site	SOIL	CSB-10	CSB-10A-C	12-15"	433	256000
Site	SOIL	CSB-10	CSB-10A-D	24-27"	2730	475000
Site	SOIL	CSB-10	CSB-10A-E	36-39"	7.1	253
Site	SOIL	CSB-10	CSB-10A-F	48-51"	1700	288000
Site	SOIL	CSB-10	CSB10B	6-9"	916	236000
Site	SOIL	CSB-10	CSB10C	12-15"	17	1500
Site	SOIL	CSB-10	CSB10D	12-15"	6.9	548
Site	SOIL	CSB11	CSB11A	0-3"	237	104000
Site	SOIL	CSB11	CSB11B	6-9"	585	351000
Site	SOIL	CSB11	CSB11C	12-15"	14	522
Site	SOIL	CSB12	CSB12A	0-3"	1050	467000
Site	SOIL	CSB12	CSB12B	6-9"	2270	372000
Site	SOIL	CSB12	CSB12C	12-15"	14	353
Site	SOIL	CSB13	CSB13A	0-3"	38	323
Site	SOIL	CSB13	CSB-13A-A	0-3"	11	2300
Site	SOIL	CSB13	CSB-13A-B	6-9"	22	1070
Site	SOIL	CSB13	CSB-13A-C	12-15"	6.6	75
Site	SOIL	CSB13	CSB-13A-D	24-27"	5.9	39
Site	SOIL	CSB13	CSB-13A-E	36-39"	6	27
Site	SOIL	CSB13	CSB13B	6-9"	11	30
Site	SOIL	CSB13	CSB13C	12-15"	10	49
Site	SOIL	CSB14	CSB14A	0-3"	2.2	28
Site	SOIL	CSB14	CSB14B	6-9"	5.7	9.8
Site	SOIL	CSB14	CSB14C	12-15"	6.4	18
Site	SOIL	CSB15	CSB15A	0-3"	7	9.6
Site	SOIL	CSB15	CSB15B	6-9"	7.8	89
Site	SOIL	CSB15	CSB15C	12-15"	5.3	28
Site	SOIL	CSB16	CSB16A	0-3"	6	209
Site	SOIL	CSB16	CSB16B	6-9"	7.2	195
Site	SOIL	CSB16	CSB16C	12-15"	7.5	234
Site	SOIL	CSB17	CSB17A	0-3"	7.3	87
Site	SOIL	CSB17	CSB17B	6-9"	7.1	20
Site	SOIL	CSB17	CSB17C	12-15"	6.9	101
Site	SOIL	CSB18	CSB18A	0-3"	7.8	70
Site	SOIL	CSB18	CSB18B	6-9"	6	26
Site	SOIL	CSB18	CSB18C	12-15"	8.3	38
Site	SOIL	CSB19	CSB19A	0-3"	9	187
Site	SOIL	CSB19	CSB19B	6-9"	6.8	79
Site	SOIL	CSB19	CSB19C	12-15"	6.7	129
Site	SOIL	CSB2	CSB2A	0-3"	266	175000

Raw Data Used in Risk Assessment

Exposure Area	MATRIX	Station	SAMPLE ID	DEPTH	Arsenic (mg/kg)	Lead (mg/kg)
Site	SOIL	CSB2	CSB2B	6-9"	159	58400
Site	SOIL	CSB2	CSB2C	12-15"	469	180000
Site	SOIL	CSB20	CSB20A	0-3"	9.6	30
Site	SOIL	CSB20	CSB20B	6-9"	6.9	19
Site	SOIL	CSB20	CSB20C	12-15"	2.4	23
Site	SOIL	CSB21	CSB21A	0-3"	7.8	31
Site	SOIL	CSB21	CSB21B	6-9"	9.3	329
Site	SOIL	CSB21	CSB21C	12-15"	6.8	32
Site	SOIL	CSB22	CSB22A	0-3"	6.3	8
Site	SOIL	CSB22	CSB22B	6-9"	6.7	7.7
Site	SOIL	CSB22	CSB22C	12-15"	6.6	9.8
Site	SOIL	CSB23	CSB23A	0-3"	7.5	10
Site	SOIL	CSB23	CSB23B	6-9"	7	11
Site	SOIL	CSB23	CSB23C	12-15"	6.2	32
Site	SOIL	CSB24	CSB24A	0-3"	4.8	28
Site	SOIL	CSB24	CSB24B	6-9"	9.3	20
Site	SOIL	CSB24	CSB24C	12-15"	4.4	12
Site	SOIL	CSB25	CSB25A	0-3"	13	411
Site	SOIL	CSB25	CSB25B	6-9"	75	2420
Site	SOIL	CSB25	CSB25C	12-15"	8.8	108
Site	SOIL	CSB26	CSB26A	0-3"	7.7	191
Site	SOIL	CSB26	CSB26B	6-9"	6.5	73
Site	SOIL	CSB26	CSB26C	12-15"	8.6	583
Site	SOIL	CSB-26	CSB-26A-A	0-3"	12	174
Site	SOIL	CSB-26	CSB-26A-B	6-9"	11	88
Site	SOIL	CSB-26	CSB-26A-C	12-15"	6.4	40
Site	SOIL	CSB-26	CSB-26A-D	24-27"	6.2	25
Site	SOIL	CSB-26	CSB-26A-E	36-39"	5.8	23
Site	SOIL	CSB27	CSB27A	0-3"	6.3	22
Site	SOIL	CSB27	CSB27B	6-9"	8.5	13
Site	SOIL	CSB27	CSB27C	12-15"	6.4	14
Site	SOIL	CSB28	CSB28A	0-3"	4.4	14
Site	SOIL	CSB28	CSB-28A-A	0-3"	53	30
Site	SOIL	CSB28	CSB-28A-B	6-9"	5.1	13
Site	SOIL	CSB28	CSB-28A-C	12-15"	7.9	27
Site	SOIL	CSB28	CSB-28A-D	24-27"	6.5	14
Site	SOIL	CSB28	CSB-28A-E	36-39"	9.4	16
Site	SOIL	CSB28	CSB28B	6-9"	10	19
Site	SOIL	CSB28	CSB28C	12-15"	23	29
Site	SOIL	CSB29	CSB29A	0-3"	9.2	32
Site	SOIL	CSB29	CSB29B	6-9"	25	44
Site	SOIL	CSB29	CSB29C	12-15"	11	36
Site	SOIL	CSB3	CSB3A	0-3"	284	121000
Site	SOIL	CSB3	CSB3B	6-9"	565	150000
Site	SOIL	CSB3	CSB3C	12-15"	217	78100
Site	SOIL	CSB3	CSB3D	24-28"	193	93900
Site	SOIL	CSB3	CSB3E	36-39"	12	232
Site	SOIL	CSB30	CSB30A	0-3"	9.5	16
Site	SOIL	CSB30	CSB-30A-A	0-3"	30	2360
Site	SOIL	CSB30	CSB-30A-B	6-9"	13	366
Site	SOIL	CSB30	CSB-30A-C	12-15"	9.1	243
Site	SOIL	CSB30	CSB-30A-D	24-27"	6.6	32

Raw Data Used in Risk Assessment

Exposure Area	MATRIX	Station	SAMPLE ID	DEPTH	Arsenic (mg/kg)	Lead (mg/kg)
Site	SOIL	CSB30	CSB-30A-E	36-39"	6.6	13
Site	SOIL	CSB30	CSB30B	6-9"	6.7	13
Site	SOIL	CSB30	CSB30C	12-15"	11	15
Site	SOIL	CSB31	CSB31A	0-3"	14	431
Site	SOIL	CSB31	CSB31B	6-9"	22	2280
Site	SOIL	CSB31	CSB31C	12-15"	6.7	10
Site	SOIL	CSB32	CSB32A	0-3"	388	42800
Site	SOIL	CSB32	CSB-32A-A	0-3"	394	164000
Site	SOIL	CSB32	CSB-32A-B	6-9"	199	90100
Site	SOIL	CSB32	CSB-32A-C	12-15"	230	64000
Site	SOIL	CSB32	CSB-32A-D	24-27"	8	40
Site	SOIL	CSB32	CSB-32A-E	36-39"	6.5	20
Site	SOIL	CSB32	CSB32B	6-9"	7.4	403
Site	SOIL	CSB32	CSB32C	12-15"	7	694
Site	SOIL	CSB33	CSB33A	0-3"	13	196
Site	SOIL	CSB33	CSB33B	6-9"	12	868
Site	SOIL	CSB33	CSB33C	12-15"	13	245
Site	SOIL	CSB34	CSB34A	0-3"	189	94500
Site	SOIL	CSB34	CSB34B	6-9"	9.1	2360
Site	SOIL	CSB34	CSB34C	12-15"	7	68
Site	SOIL	CSB35	CSB35A	0-3"	8.4	3090
Site	SOIL	CSB35	CSB-35A-A	0-3"	154	70400
Site	SOIL	CSB35	CSB-35A-B	6-9"	6.1	279
Site	SOIL	CSB35	CSB-35A-C	12-15"	408	350000
Site	SOIL	CSB35	CSB-35A-D	24-27"	6	285
Site	SOIL	CSB35	CSB-35A-E	36-39"	6.3	499
Site	SOIL	CSB35	CSB-35A-F	48-51"	6.3	69
Site	SOIL	CSB35	CSB35B	6-9"	9.5	518
Site	SOIL	CSB35	CSB35C	12-15"	7	1400
Site	SOIL	CSB35	CSB35D	24-28"	12	10800
Site	SOIL	CSB35	CSB35E	36-39"	15	4910
Site	SOIL	CSB35	CSB35F	48-51"	12	3010
Site	SOIL	CSB36	CSB36A	0-3"	170	103
Site	SOIL	CSB36	CSB36B	6-9"	15	76
Site	SOIL	CSB36	CSB36C	12-15"	12	67
Site	SOIL	CSB37	CSB37A	0-3"	30	325
Site	SOIL	CSB37	CSB37B	6-9"	7.9	314
Site	SOIL	CSB37	CSB37C	12-15"	6.8	242
Site	SOIL	CSB38	CSB38A	0-3"	4.9	22
Site	SOIL	CSB38	CSB-38A-A	0-3"	67	6200
Site	SOIL	CSB38	CSB-38A-B	6-9"	7.9	14
Site	SOIL	CSB38	CSB-38A-C	12-15"	9.3	22
Site	SOIL	CSB38	CSB-38A-D	24-27"	2.5	12
Site	SOIL	CSB38	CSB-38A-E	36-39"	8.6	319
Site	SOIL	CSB38	CSB38B	6-9"	4.4	15
Site	SOIL	CSB38	CSB38C	12-15"	7.8	19
Site	SOIL	CSB39	CSB39A	0-3"	863	46800
Site	SOIL	CSB39	CSB39B	6-9"	8	69
Site	SOIL	CSB39	CSB39C	12-15"	5.8	15
Site	SOIL	CSB4	CSB4A	0-3"	690	192000
Site	SOIL	CSB4	CSB4B	6-9"	164	460000
Site	SOIL	CSB4	CSB4C	12-15"	6.8	65

Raw Data Used in Risk Assessment

Exposure Area	MATRIX	Station	SAMPLE ID	DEPTH	Arsenic (mg/kg)	Lead (mg/kg)
Site	SOIL	CSB40	CSB40A	0-3"	39	6660
Site	SOIL	CSB40	CSB40B	6-9"	6.4	20
Site	SOIL	CSB40	CSB40C	12-15"	11	14
Site	SOIL	CSB41	CSB41A	0-3"	4.8	45
Site	SOIL	CSB41	CSB41B	6-9"	7.6	8.9
Site	SOIL	CSB41	CSB41C	12-15"	6.3	8.8
Site	SOIL	CSB42	CSB42A	0-3"	23	11
Site	SOIL	CSB42	CSB42B	6-9"	73	11
Site	SOIL	CSB42	CSB42C	12-15"	7.8	15
Site	SOIL	CSB49	CSB49A	0-3"	8.1	147
Site	SOIL	CSB49	CSB49B	6-9"	6.4	18
Site	SOIL	CSB49	CSB49C	12-15"	6.8	17
Site	SOIL	CSB5	CSB5A	0-3"	7.2	125
Site	SOIL	CSB5	CSB5B	6-9"	7.1	67
Site	SOIL	CSB5	CSB5C	12-15"	5.1	42
Site	SOIL	CSB50	CSB50A	0-3"	15	480
Site	SOIL	CSB50	CSB50B	6-9"	13	131
Site	SOIL	CSB50	CSB50C	12-15"	10	229
Site	SOIL	CSB51	CSB51A	0-3"	265	47300
Site	SOIL	CSB51	CSB51B	6-9"	187	10300
Site	SOIL	CSB51	CSB51C	12-15"	17	5680
Site	SOIL	CSB51	CSB51D	24-28"	36	18700
Site	SOIL	CSB51	CSB51E	36-39"	26	12000
Site	SOIL	CSB51	CSB51F	48-51"	18	8020
Site	SOIL	CSB6	CSB6A	0-3"	8.9	165
Site	SOIL	CSB6	CSB6B	6-9"	9.6	50
Site	SOIL	CSB6	CSB6C	12-15"	11	69
Site	SOIL	CSB7	CSB7A	0-3"	81	255000
Site	SOIL	CSB7	CSB7B	6-9"	788	154000
Site	SOIL	CSB7	CSB7C	12-15"	343	77200
Site	SOIL	CSB7	CSB7D	24-28"	6.9	114
Site	SOIL	CSB7	CSB7E	36-39"	6.2	19
Site	SOIL	CSB8	CSB8A	0-3"	66	83800
Site	SOIL	CSB8	CSB8B	6-9"	10	989
Site	SOIL	CSB8	CSB8C	12-15"	10	279
Site	SOIL	CSB9	CSB9A	0-3"	12	289
Site	SOIL	CSB9	CSB9B	6-9"	11	132
Site	SOIL	CSB9	CSB9C	12-15"	7.7	53
Site	SOIL	RSB12	RSB12A	0-3"	95	11100
Site	SOIL	RSB12	RSB12B	3-10"	125	17500
Site	SOIL	RSB14	RSB14A	0-3"	24	8100
Site	SOIL	RSB14	RSB14B	3-10"	15	8480
Site	SOIL	RSB15	RSB15A	0-3"	22	1070
Site	SOIL	RSB15	RSB15B	3-10"	10	211
Site	SOIL	RSB17	RSB17A	0-3"	10	530
Site	SOIL	RSB17	RSB17B	3-10"	9.7	21
Site	SOIL	RSB18	RSB18A	0-3"	7.8	526
Site	SOIL	RSB18	RSB18B	3-10"	6.3	50
Site	SOIL	RSB19	RSB19A	0-3"	7	11
Site	SOIL	RSB19	RSB19B	3-10"	6.8	13
Site	SOIL	RSB20	RSB20A	0-3"	14	593
Site	SOIL	RSB20	RSB20B	3-10"	10	97

Raw Data Used in Risk Assessment

Exposure Area	MATRIX	Station	SAMPLE ID	DEPTH	Arsenic (mg/kg)	Lead (mg/kg)
Site	SOIL	RSB22	RSB22A	0-3"	21	478
Site	SOIL	RSB22	RSB22B	3-10"	10	237
Site	SOIL	RSB23	RSB23A	0-3"	18	987
Site	SOIL	RSB23	RSB23B	3-10"	2.6	157
Site	SOIL	RSB25	RSB25A	0-3"	867	83500
Site	SOIL	RSB25	RSB25B	3-10"	104	7930
Site	SOIL	RSB26	RSB26A	0-3"	175	9670
Site	SOIL	RSB26	RSB26B	3-10"	184	8130
Site	SOIL	RSB27	RSB27A	0-3"	8.1	14
Site	SOIL	RSB27	RSB27B	3-10"	6.5	14
Site	SOIL	RSB28	RSB28A	0-3"	56	3140
Site	SOIL	RSB28	RSB28B	3-10"	16	478
Site	SOIL	RSB29	RSB29A	0-3"	23	1480
Site	SOIL	RSB29	RSB29B	3-10"	11	350
Site	SOIL	RSB31	RSB31A	0-3"	202	23700
Site	SOIL	RSB31	RSB31B	3-10"	232	27400
Site	SOIL	RSB32	RSB32A	0-3"	13	841
Site	SOIL	RSB32	RSB32B	3-10"	7.7	531
Site	SOIL	RSB33	RSB33A	0-3"	56	2200
Site	SOIL	RSB33	RSB33B	3-10"	10	22
Site	SOIL	RSB34	RSB34A	0-3"	6.5	19
Site	SOIL	RSB34	RSB34B	3-10"	6.3	19
Site	SOIL	RSB37	RSB37A	0-3"	17	679
Site	SOIL	RSB37	RSB37B	3-10"	13	594
Site	SOIL	RSB38	RSB38A	0-3"	14	2000
Site	SOIL	RSB38	RSB38B	3-10"	7.2	440
Site	SOIL	RSB52	RSB52A	0-3"	6.6	25
Site	SOIL	RSB52	RSB52B	3-10"	5.9	77
Site	SOIL	RSB52	RSB52C	24-30"	6.9	67
Site	SOIL	RSB53	RSB53A	0-3"	8.2	21
Site	SOIL	RSB53	RSB53B	3-10"	8.3	18
Site	SOIL	RSB53	RSB53C	24-30"	6.9	17
Site	SOIL	RSB54	RSB54A	0-3"	107	22800
Site	SOIL	RSB54	RSB54B	3-10"	94	17300
Site	SOIL	RSB54	RSB54C	24-30"	3.4	151
Site	SOIL	RSB55	RSB55A	0-3"	323	27400
Site	SOIL	RSB55	RSB55B	3-10"	359	27000
Site	SOIL	RSB55	RSB55C	24-30"	60	13100
Site	SOIL	RSB56	RSB56A	0-3"	8.6	30
Site	SOIL	RSB56	RSB56B	3-10"	7.7	27
Site	SOIL	RSB56	RSB56C	24-30"	6.1	88
Site	SOIL	RSB57	RSB57A	0-3"	235	17000
Site	SOIL	RSB57	RSB57B	3-10"	127	17400
Site	SOIL	RSB57	RSB57C	24-30"	16	3850
Site	SOIL	RSB58	RSB58A	0-3"	247	32000
Site	SOIL	RSB58	RSB58B	3-10"	200	21000
Site	SOIL	RSB58	RSB58C	24-30"	37	11100
Site	SOIL	RSB71	RSB71A	0-3"	215	66800
Site	SOIL	RSB72	RSB72A	0-3"	8.7	34
Site	SOIL	RSB72	RSB72B	3-10"	7	15
Site	SOIL	RSB72	RSB72C	24-30"	8.2	15
Site	SOIL	RSB73	RSB73A	0-3"	18	6710

Raw Data Used in Risk Assessment

Exposure Area	MATRIX	Station	SAMPLE ID	DEPTH	Arsenic (mg/kg)	Lead (mg/kg)
Site	SOIL	RSB73	RSB73B	3-10"	11	145
Site	SOIL	RSB73	RSB73C	24-30"	7.6	178
Site	SOIL	RSB74	RSB74A	0-3"	13	380
Site	SOIL	RSB74	RSB74B	3-10"	9	177
Site	SOIL	RSB74	RSB74C	24-30"	4.9	75
Site	SOIL	RSB75	RSB75A	0-3"	58	3220
Site	SOIL	RSB75	RSB75B	3-10"	15	1500
Site	SOIL	RSB75	RSB75C	24-30"	12	962
Site	SOIL	RSB76	RSB76A	0-3"	24	4.7
Site	SOIL	RSB76	RSB76B	3-10"	10	648
Site	SOIL	RSB76	RSB76C	24-30"	7.7	72
Site	SOIL	RSB77	RSB77A	0-3"	7	10700
Site	SOIL	RSB77	RSB77B	3-10"	7.7	2920
Site	SOIL	RSB77	RSB77C	24-30"	6.6	232
Site	SOIL	RSB78	RSB78A	0-3"	14	3060
Site	SOIL	RSB78	RSB78B	3-10"	12	2600
Site	SOIL	RSB78	RSB78C	24-30"	13	2960
Site	SOIL	RSB79	RSB79A	0-3"	8.5	57
Site	SOIL	RSB79	RSB79B	3-10"	6.9	205
Site	SOIL	RSB79	RSB79C	24-30"	8.1	164
Site	SOIL	RSB80	RSB80A	0-3"	7.4	85
Site	SOIL	RSB80	RSB80B	3-10"	7	23
Site	SOIL	RSB80	RSB80C	24-30"	6.7	23
Site	SOIL	RSB81	RSB81A	0-3"	9.4	229
Site	SOIL	RSB81	RSB81B	3-10"	9.3	18
Site	SOIL	RSB81	RSB81C	24-30"	7	11
Site	SOIL	RSB82	RSB82A	0-3"	8.5	16
Site	SOIL	RSB82	RSB82B	3-10"	24	37
Site	SOIL	RSB82	RSB82C	24-30"	9.3	16
Site	SOIL	RSB83	RSB83A	0-3"	9.9	17
Site	SOIL	RSB83	RSB83B	3-10"	7.4	11
Site	SOIL	RSB83	RSB83C	24-30"	16	31
Site	SOIL	RSB84	RSB84A	0-3"	10	16
Site	SOIL	RSB84	RSB84B	3-10"	15	21
Site	SOIL	RSB84	RSB84C	24-30"	5.7	12
Site	SOIL	RSB85	RSB85A	0-3"	7.1	9.1
Site	SOIL	RSB85	RSB85B	3-10"	6.7	8.2
Site	SOIL	RSB85	RSB85C	24-30"	7	8.7
Site	SED	RSED6	RSED6A	0-6"	305	57200
Site	SED	RSED6	RSED6B	6-12"	114	14800

Raw Data Used in Risk Assessment

Exposure Area	MATRIX	Station	SAMPLE ID	DEPTH	Arsenic (mg/kg)	Lead (mg/kg)
Grassy	SOIL	BSB1	BSB1A	0-3"	5.5	158
Grassy	SOIL	BSB2	BSB2A	0-3"	13	1200
Grassy	SOIL	BSB3	BSB3A	0-3"	7	257
Grassy	SOIL	BSB4	BSB4A	0-3"	16	1060
Grassy	SED	R2SED-1	R2SED-1A	0-6"	10	1210
Grassy	SED	R2SED-10	R2SED-10A	0-6"	9.4	84
Grassy	SED	R2SED-11	R2SED-11-0-6	0-6"	12	874
Grassy	SED	R2SED-12	R2SED-12-0-6	0-6"	11	411
Grassy	SED	R2SED-13	R2SED-13-0-6	0-6"	12	771
Grassy	SED	R2SED-14	R2SED-14-0-6	0-6"	11	681
Grassy	SED	R2SED-2	R2SED-2A	0-6"	10	1230
Grassy	SED	R2SED-3	R2SED-3A	0-6"	12	1570
Grassy	SED	R2SED-4	R2SED-4A	0-6"	20	2480
Grassy	SED	R2SED-5	R2SED-5A	0-6"	46	5410
Grassy	SED	R2SED-6	R2SED-6A	0-6"	44	8430
Grassy	SED	R2SED-7	R2SED-7A	0-6"	39	5480
Grassy	SED	R2SED-8	R2SED-8A	0-6"	36	8190
Grassy	SED	R2SED-9	R2SED-9A	0-6"	29	3630
Grassy	SOIL	RSB1	RSB1A	0-3"	11	873
Grassy	SOIL	RSB10	RSB10A	0-3"	14	1850
Grassy	SOIL	RSB11	RSB11A	0-3"	13	641
Grassy	SOIL	RSB13	RSB13A	0-3"	11	682
Grassy	SOIL	RSB16	RSB16A	0-3"	13	661
Grassy	SOIL	RSB2	RSB2A	0-3"	14	1100
Grassy	SOIL	RSB21	RSB21A	0-3"	8.3	497
Grassy	SOIL	RSB24	RSB24A	0-3"	20	1980
Grassy	SOIL	RSB3	RSB3A	0-3"	9.1	632
Grassy	SOIL	RSB30	RSB30A	0-3"	15	887
Grassy	SOIL	RSB35	RSB35A	0-3"	10	43
Grassy	SOIL	RSB36	RSB36A	0-3"	9.2	216
Grassy	SOIL	RSB39	RSB39A	0-3"	10	227
Grassy	SOIL	RSB4	RSB4A	0-3"	22	2360
Grassy	SOIL	RSB40	RSB40A	0-3"	19	901
Grassy	SOIL	RSB41	RSB41A	0-3"	10	341
Grassy	SOIL	RSB42	RSB42A	0-3"	15	834
Grassy	SOIL	RSB43	RSB43A	0-3"	20	1130
Grassy	SOIL	RSB44	RSB44A	0-3"	9.5	369
Grassy	SOIL	RSB45	RSB45A	0-3"	6.1	487
Grassy	SOIL	RSB46	RSB46A	0-3"	3.9	385
Grassy	SOIL	RSB49	RSB49A	0-3"	20	1060
Grassy	SOIL	RSB5	RSB5A	0-3"	10	985
Grassy	SOIL	RSB50	RSB50A	0-3"	38	5470
Grassy	SOIL	RSB51	RSB51A	0-3"	169	12600
Grassy	SOIL	RSB6	RSB6A	0-3"	22	1880
Grassy	SOIL	RSB7	RSB7A	0-3"	14	1150
Grassy	SOIL	RSB-70	RSB-70A	0-3"	212	6420
Grassy	SOIL	RSB8	RSB8A	0-3"	23	1050
Grassy	SOIL	RSB9	RSB9A	0-3"	96	14500
Grassy	SED	RSED1	RSED1A	0-6"	310	19300
Grassy	SED	RSED10	RSED10A	0-6"	96	29300
Grassy	SED	RSED2	RSED2A	0-6"	713	73800
Grassy	SED	RSED3	RSED3A	0-6"	740	95300

Raw Data Used in Risk Assessment

Exposure Area	MATRIX	Station	SAMPLE ID	DEPTH	Arsenic (mg/kg)	Lead (mg/kg)
Grassy	SED	RSED4	RSED4A	0-6"	2300	243000
Grassy	SED	RSED5	RSED5A	0-6"	1230	228000
Grassy	SED	RSED7	RSED7A	0-6"	170	46000
Grassy	SED	RSED8	RSED8A	0-6"	159	34800
Grassy	SED	RSED9	RSED9A	0-6"	124	32400

Raw Data Used in Risk Assessment

Exposure Area	MATRIX	Station	SAMPLE ID	DEPTH	Arsenic (mg/kg)	Lead (mg/kg)
Off site	SOIL	R2BG-1	R2BG-1A	0-3"	9.8	
Off site	SOIL	R2BG-2	R2BG-2A	0-3"	10	
Off site	SOIL	R2BG-3	R2BG-3A	0-3"	6	
Off site	SOIL	R2BG-4	R2BG-4A	0-3"	3.1	
Off site	SOIL	R2SB-1	R2SB-1A	0-3"	141	1750
Off site	SOIL	R2SB-1	R2SB-1A-A	0-3"	58	2250
Off site	SOIL	R2SB-10	R2SB-10A	0-3"	8.9	25
Off site	SOIL	R2SB-11	R2SB-11A	0-3"	14	360
Off site	SOIL	R2SB-12	R2SB-12A	0-3"	11	222
Off site	SOIL	R2SB-13	R2SB-13A	0-3"	53	7390
Off site	SOIL	R2SB-13	R2SB-13A-A	0-3"	14	2910
Off site	SOIL	R2SB-14	R2SB-14A	0-3"	8.6	89
Off site	SOIL	R2SB-15	R2SB-15A	0-3"	4.8	265
Off site	SOIL	R2SB-16	R2SB-16A	0-3"	7.7	179
Off site	SOIL	R2SB-17	R2SB-17A	0-3"	25	4160
Off site	SOIL	R2SB-18	R2SB-18A	0-3"	10	669
Off site	SOIL	R2SB-19	R2SB-19A	0-3"	16	796
Off site	SOIL	R2SB-2	R2SB-2A	0-3"	19	1290
Off site	SOIL	R2SB-2	R2SB-2A-A	0-3"	16	918
Off site	SOIL	R2SB-20	R2SB-20A	0-3"	9.6	486
Off site	SOIL	R2SB-21	R2SB-21A	0-3"	10	296
Off site	SOIL	R2SB-22	R2SB-22A	0-3"	13	734
Off site	SOIL	R2SB-23	R2SB-23A	0-3"	10	463
Off site	SOIL	R2SB-24	R2SB-24A	0-3"	13	779
Off site	SOIL	R2SB-3	R2SB-3A	0-3"	38	991
Off site	SOIL	R2SB-3	R2SB-3A-A	0-3"	36	1620
Off site	SOIL	R2SB-4	R2SB-4A	0-3"	26	1980
Off site	SOIL	R2SB-4	R2SB-4A-A	0-3"	28	2490
Off site	SOIL	R2SB-5	R2SB-5A	0-3"	10	121
Off site	SOIL	R2SB-52	R2SB-52-A	0-3"	4.6	300
Off site	SOIL	R2SB-6	R2SB-6A	0-3"	12	587
Off site	SOIL	R2SB-7	R2SB-7A	0-3"	9.6	78
Off site	SOIL	R2SB-8	R2SB-8A	0-3"	13	197
Off site	SOIL	R2SB-9	R2SB-9A	0-3"	47	3330
Off site	SOIL	RSB-63	RSB-63A	0-3"	16	1330
Off site	SOIL	RSB-64	RSB-64A	0-3"	32	1470
Off site	SOIL	RSB-69	RSB-69A	0-3"	55	2750

Onsite Lead Data

Data Averaged by Location

Exposure Area	Station	Year	Number of Samples	Average (mg/kg)
Site	CSB1	1999	3	135837
Site	CSB1	2001	6	41830
Site	CSB-10	1999	4	92512
Site	CSB-10	2001	6	170374
Site	CSB11	1999	3	151841
Site	CSB12	1999	3	279784
Site	CSB13	1999	3	134
Site	CSB13	2001	5	702
Site	CSB14	1999	3	19
Site	CSB15	1999	3	42
Site	CSB16	1999	3	213
Site	CSB17	1999	3	69
Site	CSB18	1999	3	45
Site	CSB19	1999	3	132
Site	CSB2	1999	3	137800
Site	CSB20	1999	3	24
Site	CSB21	1999	3	131
Site	CSB22	1999	3	9
Site	CSB23	1999	3	18
Site	CSB24	1999	3	20
Site	CSB25	1999	3	980
Site	CSB26	1999	3	282
Site	CSB-26	2001	5	70
Site	CSB27	1999	3	16
Site	CSB28	1999	3	21
Site	CSB28	2001	5	20
Site	CSB29	1999	3	37
Site	CSB3	1999	5	88646
Site	CSB30	1999	3	15
Site	CSB30	2001	5	603
Site	CSB31	1999	3	907
Site	CSB32	1999	3	14632
Site	CSB32	2001	5	63632
Site	CSB33	1999	3	436
Site	CSB34	1999	3	32309
Site	CSB35	1999	6	3955
Site	CSB35	2001	6	70255
Site	CSB36	1999	3	82
Site	CSB37	1999	3	294
Site	CSB38	1999	3	19
Site	CSB38	2001	5	1313
Site	CSB39	1999	3	15628
Site	CSB4	1999	3	217355
Site	CSB40	1999	3	2231
Site	CSB41	1999	3	21
Site	CSB42	1999	3	12
Site	CSB49	1999	3	61
Site	CSB5	1999	3	78
Site	CSB50	1999	3	280
Site	CSB51	1999	6	17000
Site	CSB6	1999	3	95
Site	CSB7	1999	5	97267
Site	CSB8	1999	3	28356
Site	CSB9	1999	3	158
Site	RSB12	1999	2	14300
Site	RSB14	1999	2	8290
Site	RSB15	1999	2	641

Onsite Lead Data

Data Averaged by Location

Exposure Area	Station	Year	Number of Samples	Average (mg/kg)
Site	RSB17	1999	2	276
Site	RSB18	1999	2	288
Site	RSB19	1999	2	12
Site	RSB20	1999	2	345
Site	RSB22	1999	2	358
Site	RSB23	1999	2	572
Site	RSB25	1999	2	45715
Site	RSB26	1999	2	8900
Site	RSB27	1999	2	14
Site	RSB28	1999	2	1809
Site	RSB29	1999	2	915
Site	RSB31	1999	2	25550
Site	RSB32	1999	2	686
Site	RSB33	1999	2	1111
Site	RSB34	1999	2	19
Site	RSB37	1999	2	637
Site	RSB38	1999	2	1220
Site	RSB52	1999	3	56
Site	RSB53	1999	3	19
Site	RSB54	1999	3	13417
Site	RSB55	1999	3	22500
Site	RSB56	1999	3	48
Site	RSB57	1999	3	12750
Site	RSB58	1999	3	21367
Site	RSB71	1999	1	66800
Site	RSB72	1999	3	21
Site	RSB73	1999	3	2344
Site	RSB74	1999	3	211
Site	RSB75	1999	3	1894
Site	RSB76	1999	3	242
Site	RSB77	1999	3	4617
Site	RSB78	1999	3	2873
Site	RSB79	1999	3	142
Site	RSB80	1999	3	44
Site	RSB81	1999	3	86
Site	RSB82	1999	3	23
Site	RSB83	1999	3	20
Site	RSB84	1999	3	16
Site	RSB85	1999	3	9
Site	RSED6	1999	2	36000

Onsite Arsenic Data

Data Averaged by Location

Exposure Area	Station	Year	Num Samples	Avg Conc (mg/kg)
Site	CSB1	1999	3	337.7
Site	CSB1	2001	6	168.4
Site	CSB-10	1999	4	412.2
Site	CSB-10	2001	6	813.5
Site	CSB11	1999	3	278.7
Site	CSB12	1999	3	1111.3
Site	CSB13	1999	3	19.7
Site	CSB13	2001	5	10.3
Site	CSB14	1999	3	4.8
Site	CSB15	1999	3	6.7
Site	CSB16	1999	3	6.9
Site	CSB17	1999	3	7.1
Site	CSB18	1999	3	7.4
Site	CSB19	1999	3	7.5
Site	CSB2	1999	3	298.0
Site	CSB20	1999	3	6.3
Site	CSB21	1999	3	8.0
Site	CSB22	1999	3	6.5
Site	CSB23	1999	3	6.9
Site	CSB24	1999	3	6.2
Site	CSB25	1999	3	32.3
Site	CSB26	1999	3	7.6
Site	CSB-26	2001	5	8.3
Site	CSB27	1999	3	7.1
Site	CSB28	1999	3	12.5
Site	CSB28	2001	5	16.4
Site	CSB29	1999	3	15.1
Site	CSB3	1999	5	254.2
Site	CSB30	1999	3	9.1
Site	CSB30	2001	5	13.1
Site	CSB31	1999	3	14.2
Site	CSB32	1999	3	134.1
Site	CSB32	2001	5	167.5
Site	CSB33	1999	3	12.7
Site	CSB34	1999	3	68.4
Site	CSB35	1999	6	10.7
Site	CSB35	2001	6	97.8
Site	CSB36	1999	3	65.7
Site	CSB37	1999	3	14.9
Site	CSB38	1999	3	5.7
Site	CSB38	2001	5	19.1
Site	CSB39	1999	3	292.3
Site	CSB4	1999	3	286.9
Site	CSB40	1999	3	18.8
Site	CSB41	1999	3	6.2
Site	CSB42	1999	3	34.6
Site	CSB49	1999	3	7.1
Site	CSB5	1999	3	6.5
Site	CSB50	1999	3	12.7
Site	CSB51	1999	6	91.5
Site	CSB6	1999	3	9.8
Site	CSB7	1999	5	245.0
Site	CSB8	1999	3	28.7
Site	CSB9	1999	3	10.2
Site	RSB12	1999	2	110.0
Site	RSB14	1999	2	19.5
Site	RSB15	1999	2	16.0

Exposure Area	Station	Year	Num Samples	Avg Conc (mg/kg)
Site	RSB17	1999	2	9.9
Site	RSB18	1999	2	7.1
Site	RSB19	1999	2	6.9
Site	RSB20	1999	2	12.0
Site	RSB22	1999	2	15.5
Site	RSB23	1999	2	10.3
Site	RSB25	1999	2	485.5
Site	RSB26	1999	2	179.5
Site	RSB27	1999	2	7.3
Site	RSB28	1999	2	36.0
Site	RSB29	1999	2	17.0
Site	RSB31	1999	2	217.0
Site	RSB32	1999	2	10.4
Site	RSB33	1999	2	33.0
Site	RSB34	1999	2	6.4
Site	RSB37	1999	2	15.0
Site	RSB38	1999	2	10.6
Site	RSB52	1999	3	6.5
Site	RSB53	1999	3	7.8
Site	RSB54	1999	3	68.1
Site	RSB55	1999	3	247.3
Site	RSB56	1999	3	7.5
Site	RSB57	1999	3	126.0
Site	RSB58	1999	3	161.3
Site	RSB71	1999	1	215.0
Site	RSB72	1999	3	8.0
Site	RSB73	1999	3	12.2
Site	RSB74	1999	3	9.0
Site	RSB75	1999	3	28.3
Site	RSB76	1999	3	13.9
Site	RSB77	1999	3	7.1
Site	RSB78	1999	3	13.0
Site	RSB79	1999	3	7.8
Site	RSB80	1999	3	7.0
Site	RSB81	1999	3	8.6
Site	RSB82	1999	3	13.9
Site	RSB83	1999	3	11.1
Site	RSB84	1999	3	10.2
Site	RSB85	1999	3	6.9
Site	RSED6	1999	2	209.5

Future land use : Just holding -

Fine soil contributes more of .

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF: **DE-9J**

January 18, 2005

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Matthew A. Love
Manager-Regulatory Affairs
Exide Technologies
3000 Montrose Avenue
Reading, PA 19605

Corrective Measures Study Report
Refined Metals Corporation
IND 000 718 130

Dear Mr. Love:

The United States Environmental Protection Agency (U.S. EPA) has completed the review of the October 12, 2004, Corrective Measures Study (Phase 1) Report for the Refined Metals Corporation facility. We are unable to approve the Report in large part due to the shortcomings identified in the Baseline Human Health Risk Assessment(HHRA) report and unresolved groundwater issues at the facility. We note in your response that you are waiting for an approval from IDEM to install the proposed MW-12. We believe that if RMC should properly install this new monitoring well prior to obtaining an approval from IDEM with all data accurately presented, the U.S. EPA would not consider this proactive effort as unreasonable since both parties agree that groundwater information retrieved from this new well could help to resolve the outstanding groundwater data dispute. The We have included with this letter an attachment containing comments that are pertinent to the shortcomings identified in the HHRA.

Finally, we strongly recommend that you call U.S. EPA within (7) days of receipt of this letter to schedule a meeting to discuss the comments in the attachment prior to revising the Report. RMC should also submit a complete response to U.S. EPA's comments including any requested data for review prior to the meeting.

If you have any questions, I can be reached at (312) 886-7954.

Sincerely,

Jonathan Adenuga
Corrective Action Section
Enforcement Compliance Assurance Branch

cc: K. Pawski-Hogan, Techlaw Inc.,
cc: Ruth Jean, IDEM

ATTACHMENT

1. **Section 2.0, Field Activities, Page 2-1:** The last paragraph states that "Groundwater samples were collected from all the Site groundwater monitoring wells between October 26 and 28, 2004 using low flow sample collection techniques." It is an impossibility for these activities to have been conducted during these dates, especially given that the revised CMS Report is dated October 13, 2004. Revise the CMS Report to provide the correct dates that the aforementioned activities were conducted.

2. **Attachment 1, Appendix B:** It is unclear whether the groundwater samples submitted to the analytical laboratory were representative of groundwater conditions. From a review of the purge logs in Appendix B of Attachment 1 to the CMS Report, it appears that at many monitoring wells, parameters appeared to stabilize, with the exception of the last reading. For example, in monitoring well MW-5, the last several dissolved oxygen (DO) readings were 0.65, 0.65, 0.64, and 0.62, and turbidity readings were 26.1, 21.3, 20.8, and 19.9. However, the last DO and turbidity readings at monitoring well MW-5 were 1.81 and 65.3, respectively. The cause of these erratic readings is unclear. Erratic readings were observed for the following monitoring wells: MW-1 (DO and turbidity), MW-2 (DO and turbidity), MW-5 (DO and turbidity), MW-6 (DO and turbidity), MW-7 (turbidity), MW-9 (DO), MW-10 (turbidity), and MW-11 (turbidity). Discuss the cause of these erratic readings for the aforementioned monitoring wells, and to clarify whether the samples collected for laboratory analysis were collected at the time of the last reading. If samples were collected at the time of the last reading and submitted for laboratory analysis, revise the CMS Report to discuss whether these samples are actually representative of groundwater conditions.

3. **Section 4.2.2, Sediment Sampling Results** : The text suggests that offsite sediment samples did not exceed HHRA clean up level for lead. However no rationale is provided as to how a clean up level derived from on site soil data is considered a surrogate for sediment exposure. Further, soil data clean up level cannot be applied to the sediment as they are considered 2 distinct populations. In contrast to preliminary remediation goal, obtained by defined parameters, clean up level is derived from eliminating certain data points that are responsible for elevated exposure point concentration. Thus it is not acceptable to extrapolate the remediation action level from soil to sediment.

4. **Section 5.0, Summary:** summarizes that additional sediment sampling proposed in the drainage ditch that drains around west side of the Citizens gas property from the railroad right of way. The proposed sampling focuses on sampling between RS2B26 and RS2B27 locations and extending into Citizens Gas Property. If additional sampling is focused on further delineation of lead and arsenic contamination, sampling points between R2SB29 and R2SB30 should also be included.

3.1. Potential Receptors and Exposure Pathways

Apart from groundskeeper, trespasser and worker scenario, the grassy area should also include future construction worker scenario. It is not clear why the future worker exposure duration for grassy area is 144 days (4 days/week for 36 weeks) which is much shorter than 225 day (5 days/week for 45 weeks) of offsite Gas facility worker duration.

3.2. Exposure Point Concentration

Please verify if the data gathered from closure plan sample locations as depicted in Figure 4-3 and inorganic data summary table in RFI report - Phase 1 have been included in this HHRA of on site facility worker scenario. The section 1.2 on previous investigations does not provide adequate information on the Beech Grove closure investigation. Please expand this section if in case data gathered during closure plan were excluded in determining the exposure point concentration of lead and arsenic in main plant.

As shown in Fig 5-9 and 5-10 of Phase I RFI report (March 29, 2000), sediment samples RSED1 through RSED12, including the samples in the Lagoon represent a distinct population. Samples such as RSED6, RSED11 and RSED12 belong in main facility area and the rest belong to Grassy area. The lead and arsenic concentration in these samples form 0 to12" constitute a distinct population when compared to the rest of the soil data in the grassy area. It is recommended that exposure point concentrations for onsite and offsite sediment contamination be calculated separately and not pooled with soil data.

The exposure point concentration calculated by obtaining 95% UCL for arsenic and the mean concentration for lead is not transparent in this HHRA. Details such as number of samples, minimum concentration, maximum concentration, frequency of detects and the type of non parametric statistical analysis employed in calculating the EPC should be provided in the revised HHRA. Please also submit the raw data of COPCs for all the sample locations in each exposure areas. Also, it is not clear how the remedial action level was obtained based on the preliminary remediation goal (PRG). Please indicate the sample locations that will be subjected to remediation and explain how the post remedial data points meet the average concentration that is equivalent to preliminary remediation goal.

5.4 Lead Risk Assessment, Table 6 Adult lead model input values

The original TRW adult lead model guidance (1996) suggested that data from the NHANES III Survey should be used to set plausible ranges for two parameters: PbB *adult,0* (typical blood lead concentration of female adult of child-bearing age) and GSD *i,adult* (geometric standard deviation on the typical blood lead concentration of female adult of child-bearing age). EPA performed an updated analysis of the NHANES III data to make additional recommendations on

the values of PbB *adult,0* and GSD *i,adult* that should be employed in the analysis of adult lead exposure [2]. In the updated analysis, the original NHANES III data were further analyzed by U.S. geographic quadrants and race/ethnicity groups.

For application of the adult lead methodology at a given site, estimates of the PbB *adult,0* and GSD *i,adult* parameters could be based on either race/ethnicity or geographic categories determined to be appropriate based on the specific demographic or geographic characteristics of the site. Because of the small sample sizes that result, the TRW recommended not to use data from the NHANES III survey that are stratified by both census region and race/ethnicity group. Values selected for a site should consider the geographic region as well as the present and future ethnicity of the exposed population. Because the future worker population at a midwestern U.S. site is likely to be heterogeneous and could consist of several ethnic groups, the combined data on ethnic groups should be employed. The quadrant data for the midwest is shown in Table 3a of the report [2]. For the midwest quadrant (including all EPA Region 5 States), the values of PbB *adult,0* and GSD *i,adult* for the combined ethic groups (i.e., All Race/Ethnicity) are 1.53 ug/dL and 2.18, respectively (Blood lead concentrations of the U.S. Adult females: Summary Statistics from Phases I and II of the National Health and Nutrition Evaluation Survey (NHANESIII) (OSWER #9285.7-52; March 2002).

The above TRW-recommended values for AFS, PbB *adult,0* and GSD i,adult should be combined with the other parameter values recommended for the long-term worker by the TRW and cited by Refined Metals in Table 6 of the Risk Assessment Report. Using these parameter values, the TRW has calculated a target soil lead concentration (RBClead) value of 1079 mg/kg, or approximately 1100 mg/kg [2]. That is the value that is acceptable to the EPA as the target soil lead concentration for the current and future nonresidential/industrial land use at the main facility area, grassy areas and the off site Natural Gas Facility. If proper justification is provided on the exposure frequency of 144 days for routine workers in grassy area, a lead PRG of 1623 mg/kg (based on TRW recommended values and 144 days of exposure frequency) can be used.

5.4 Lead Risk Assessment, Table 7 Summary of Lead Risks and Cleanup Goals

Gradient on behalf of refined metals calculated a PRG of 4601 ppm of lead for construction worker onsite and a related remedial action level of 78,900 ppm. It appears that the exposure scenario described for the construction worker in the risk assessment report cannot be used to derive a meaningful action level/remediation goal for construction workers for the following reasons.

(a) The excavation or construction worker is likely to be an outside contract worker who performs the excavation within 50 workdays. If the worker is on-site 5 days/week, the project will be completed in 10 weeks or 70 days. Consequently, the Exposure Duration and the Averaging time (AT) for the project are 70 days, not 365 days as for the facility worker. The adult lead methodology is designed to estimate blood lead concentrations (PbB) for workers who have a sustained period of contact with exposure media. The default assumption for the averaging time is 1 year which is sufficient for PbB to approach quasi-steady state (

Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to lead in Soil, Dec 1996). If exposures are expected to occur over a shorter time interval, then EF should not be prorated over the entire year. As explained in the adult lead model guidance, the shortest appropriate time period for application of the model is 90 days because of the requirement for the blood lead concentration to reach a steady state after lead intake. Time periods less than 90 days are more indicative of acute exposures which cannot be addressed by the model.

(b) For the purposes of illustration, EPA assumed that the proposed construction required 50 days (as suggested in the HHRA) and would be completed within the minimum required ED/AT of 90 days. In combination with the other TRW- recommended exposure parameters as described above, PRG lead value for a construction worker happens to be 576 mg/kg. This value is lower than the acceptable target soil lead concentration of 1100 mg/kg for surface soil. EPA believes that this is further evidence that the proposed construction worker scenario cannot be used to derive a meaningful action level/remediation goal for surface and subsurface soil.

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October 12, 2004 2003-1046-01

Mr. Jonathan Adenuga
United States Environmental Protection Agency – Region V
77 West Jackson Boulevard
Chicago, IL 60604-3590

RE: Refined Metals Corporation
Beech Grove, Indiana
Response to USEPA Comments on Phase 1 CMS Report

Dear Jonathan:

On behalf of Refined Metals Corporation (RMC), Advanced GeoServices Corp. (AGC) has prepared this response to the comments contained in the August 17, 2004 letter from the United States Environmental Protection Agency (USEPA) Region 5 Corrective Action Section to RMC. The USEPA comments were received by RMC on September 3, 2004. The USEPA comments pertained to the June 22, 2004 Corrective Measure Study (CMS) Phase 1 Report for RMC facility in Beech Grove, Indiana.

The responses are provided in order they are made in the letter. To facilitate your review we have restated the comment followed by the response.

General Comments from Cover Letter

Comment: 1. The CMS Report, which included the Risk Assessment, does not include a color coded map delineating the 3 areas that are being evaluated during the risk assessment.

Response: A color coded map is attached to this letter. A second map is provided as Figure 1 for the Basline Human Health Risk Assessment.

Comment: 2. The groundwater flow in the area around MW-6SR has not been adequately described in the CMS report. Also, groundwater information from a new well proposed between MW-3 and MW-6SR MW-12) is still outstanding.

Response: RMC is waiting on approval from the Indiana Department of Environmental Management (IDEM) on the Groundwater Monitoring Plan before installation of the proposed well.

Specific Comments from Attachment

Comment: 1. Section 3.0, Sediment Sampling: This section states that sediment was collected at depth intervals 0-3 inches below ground surface (bgs) and 3-10 inches bgs at each of the R2SB locations. However, Section 2.3, Phase I Corrective Measures Study Activities, of the CMS Work Plan indicates that all samples collected from the R2SB locations would be collected at depth intervals of 0-6 inches bgs and 6-12 inches bgs. Revise the CMS Report to explain the sampling deviation from the approved CMS Work Plan and to describe any inconsistencies that may result from comparing a sample collected at 0-3 inches bgs with a standard based on 0-6 inches bgs.

Response: The CMS Report has been revised as requested. The impact of the inadvertent deviation would be that the 0–3 inch deep sample would likely have a concentration equal to or higher than a 0–6 inch deep sample. Similarly, the 3-10 inch deep sample would be expected to have a higher concentration than the 6-12 inch horizon.

Comment: 2. Section 3.3.2, Dermal Contact with Surface Soil (page 10). The dermal exposure factor input values were obtained from U.S. EPA's *Risk Assessment Guidance for Superfund (RAGS) Dermal Risk Assessment Interim Guidance (Final Draft),* dated March 1999. However, this interim guidance was subsequently updated in March 2003 and entitled *RAGS Part E – Supplemental Guidance for Dermal Risk Assessment.* Although the values cited from the 1999 guidance (dermal absorption fraction and soil-to-skin adherence factor) remain unchanged in the 2003 guidance, future risk assessment documents should reference the March 2003 RAGS Part E to ensure that dermal risk assessment evaluations are conducted in accordance with the most recent and applicable U.S. EPA guidance.

Response: The text of the Human Health Baseline Risk Assessment has been changed to indicate that the USEPA's Dermal Risk Assessment Guidance from 2004 has been utilized (USEPA, 2004c). The 2004 document is the final version of the 2003 draft guidance referenced in the comment.

Comment: 3. Section 4.2.2 Sediment Sampling Results: This section of the CMS Report indicates that the validated results for the sediment samples are provided in Table 4-1. From the information provided, U.S. EPA is unable to verify that the results provided in the CMS Report were validated in accordance with approved methods. Provide all data related to the validation of these results for verification.

Response: A copy of the complete validation report is attached to the revised CMS Phase 1 Report.

Comment: **4. Section 5.0, Summary, Groundwater: This section states that groundwater flow in the shallow zone of saturation on-site appears to be to the south-southeast. However, it appears from Figure 4-1 that there are localized on-site areas where the shallow groundwater flow is not south-southeast. For example, the groundwater elevation at MW-11 is shown as 836.34 while the other groundwater elevation at MW-8, located to the west of MW-11, is shown as 834.8. These measurement readings indicate a westerly component of flow in this area of the site. A similar situation appears to be present in the area of the site near MW-5 and MW-6SR. Revise the CMS Report to discuss in more detail those areas of the site where the local groundwater flow is not to the south-southeast. Also, provide possible explanation(s) of why the groundwater elevation is lower than surrounding areas at MW-6SR and MW-8.**

Response: The CMS Phase 1 Report text has been revised as requested. It should also be noted, that installation of the additional well proposed in the Groundwater Monitoring Plan submitted to IDEM will provide additional detail for the localized groundwater conditions.

Comment: **5. Section 5.0, Summary, Sediment: The first bullet point of the Sediment section states that elevated arsenic in sediment on the drainage ditch along Arlington Avenue and along the CSX line northeast of the site indicate that off-site transport of sediment may have occurred. It is unclear from the information presented if additional sampling will be performed to determine if off-site transport of sediment occurred. Revise the CMS Report to indicate what additional tasks, if any, will take place. If additional work will not be performed to determine if off-site transport of sediment occurred, provide justification for the decision. Alternatively, if this will be further addressed in Phase II of the CMS, revise the CMS Report to state this.**

Response: The CMS Phase 1 Report text has been revised to indicate that additional sampling will be performed in the ditch that receives drainage from those areas of the CSX line represented by the CMS Phase 1 sediment sampling. No additional sediment sampling is proposed in the grass lined swale along Arlington Avenue, as previous sampling has produced down stream results that are less than 400 mg/kg.

Comment: 6. **Section 5.3, Estimated Cancer and Noncancer Risks (pages 16 and 17). Cancer risks fall within the NCP risk range of 10^{-6} to 10^{-4}. However, the decision regarding whether or not these estimates are "acceptable" remains at the discretion of U.S. EPA, based on site-specific circumstances. Since the current estimates of risk and hazard for several receptors may be underestimated (see Specific Comment 7 regarding ingestion rate values), cancer risk should be reevaluated for the industrial and construction worker receptor groups before a decision is made about the "acceptability" of estimated risk or hazard. In addition, the potential for excavation of arsenic- and lead-contaminated soils is not discussed. Any potential reduction of risk after soil excavation can, and should, be discussed.**

Response: Conclusions regarding the acceptability of the risk have been removed from the text. The risk assessment for arsenic has been re-evaluated using the recommended values for the on-site construction and utility workers and groundskeeper. In addition, a discussion has been provided in Section 6.2 of the Risk Assessment Report regarding the reduction in risk resulting from soil remediation.

Comment: 7. **Figure 3-1: This figure indicates that Sample R2SB26 did not have results for arsenic levels at the surface or subsurface intervals. It is not clear why there were no arsenic results for this sample. Revise the CMS Report to clarify why there were no arsenic results from Sample R2SB26.**

Response: Arsenic results are available for R2SB26. Figure 3-1 has been revised to show these results.

Comment: 8. **Table 3 (Summary of Exposure Factor Input Values) and Section 3.3.1, Ingestion of Soil (pages 7 and 9). The ingestion rates use to estimate risk and hazard for industrial and construction workers appear low, based on current available guidance documents, and may result in an underestimation of risk and hazard to applicable receptors. U.S. EPA's *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (U.S. EPA, December 2002) provides an ingestion rate for a construction worker receptor of 330 milligrams per day (mg/d). This is significantly greater than the ingestion rate used in the CMS Report of 100 mg/d. Based on the probability of a similar exposure, the ingestion rate for a utility worker should probably be the same as, or close to, the values used for a construction worker in the absence of compelling site-specific information to the contrary. The incidental soil ingestion rate used**

for estimating exposure to a landscaper/groundskeeper receptor also appears low. The value of 50 mg/d used in the CMS Report appears to be based on a generic industrial worker receptor who spends a majority of the work day indoors. However, the nature of groundskeeping work would indicate the use of an ingestion rate for an outdoor industrial worker. An incidental soil ingestion rate of 100 mg/d is provided in the *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (USEPA, 2002). Revise the CMS Report and the calculation of risk and hazard using more appropriate values (or the values cited herein) for the soil ingestion rates.

Response: The Risk Assessment for arsenic has been revised utilizing soil ingestion rates of 330 mg/day for the on-site construction and utility worker. 100 mg/day has been used for the groundskeeper. The Site worker and adolescent trespasser are based on 50 mg/day.

Minor Comment

Comment: 1. Figure 3-1: This figure shows two sampling points labeled R2SB29. It appears that one of these sampling locations should be labeled as R2SB30. Revise the CMS Report to correct this apparent discrepancy.

Response: The figure has been revised.

We believe this letter addresses each of the comments contained in your August 17, 2004 letter. If you have any questions or require additional information, please call me at 610-840-9122.

Sincerely,

ADVANCED GEOSERVICES CORP.

Paul G. Stratman, P.E., P.G.
Senior Project Consultant

PGS:vm

cc: Ruth Jean, IDEM
Matt Love, Exide

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

August 17, 2004

REPLY TO THE ATTENTION OF:

DE-9J

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Matthew A. Love
Manager-Regulatory Affairs
Exide Corporation
645 Penn Street
Reading, PA 19612-4205

Corrective Measures Study Report
Refined Metals Corporation
IND 000 718 130

Dear Mr. Love:

The United States Environmental Protection Agency (U.S. EPA) has completed the review of the June 22, 2004, Corrective Measures Study (Phase 1) Report for the Refined Metals Corporation facility. We are unable to approve this report in its current condition due to the shortcomings identified in the report. We have included with this letter an attachment containing comments that are pertinent to these shortcomings that must be addressed.

In the Conditional Approval Letter for the CMS Work Plan, dated September 3, 2003 (CA Letter), U.S. EPA indicated in Response to Comment 2 that RMC must provide a color coded map of the 3 areas that would be evaluated during the risk assessment. The CMS Report, which includes the risk assessment, does not include a color coded map delineating the 3 areas that are being evaluated. Provide these color coded map areas as requested. Also in the CA Letter, U.S. EPA indicated that the potential for contamination to migrate downgradient between wells MW-6SR and MW-3 without detection exists since MW-04 is located at a distance that would not allow for immediate detection. In a response to the CA Letter, RMC stated that evaluation of the area between MW-3 and MW-6SR relative to the shallow groundwater potentiometric map shows that the groundwater monitoring well network is adequate and no additional monitoring wells are required. However, as indicated in Comment 3 of this attachment, the groundwater flow in the area around MW-6SR has not been adequately described in the CMS Report. **We also note that in a August 2004 Sampling and Analysis Plan submitted to IDEM, a new monitoring well (MW-12) was proposed .** This new well will be located between MW-3 and

MW6SR approximately at the southwest toe of the onsite Lagoon. Groundwater information from this new well is still outstanding and may help explain the groundwater flow regime east of the facility. The revised CMS report must be submitted to U.S. EPA within 30 days of receipt of this letter.

If you have any questions, I can be reached at (312) 886-7954.

Sincerely,

Jonathan Adenuga
Corrective Action Section
Enforcement Compliance Assurance Branch

cc: K. Pawski-Hogan, Techlaw Inc.,
cc: Ruth Jean, IDEM

ATTACHMENT

SPECIFIC COMMENTS

1. **Section 3.0, Sediment Sampling:** This section states that sediment was collected at depth intervals 0-3 inches below ground surface (bgs) and 3-10 inches bgs at each of the R2SB locations. However, Section 2.3, Phase I Corrective Measures Study Activities, of the CMS Work Plan indicates that all samples collected from the R2SB locations would be collected at depth intervals of 0-6 inches bgs and 6-12 inches bgs. Revise the CMS Report to explain the sampling deviation from the approved CMS Work Plan and to describe any inconsistencies that may result from comparing a sample collected at 0-3 inches bgs with a standard based on 0-6 inches bgs.

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off-site transport of sediment occurred. Revise the CMS Report to indicate what additional tasks, if any, will take place. If additional work will not be performed to determine if off-site transport of sediment occurred, provide justification for the decision. Alternatively, if this will be further addressed in Phase II of the CMS, revise the CMS Report to state this.

6. **Section 5.3, Estimated Cancer and Noncancer Risks (pages 16 and 17).** Cancer risks fall within the NCP risk range of 10^{-6} to 10^{-4}. However, the decision regarding whether or not these estimates are "acceptable" remains at the discretion of U.S. EPA, based on site-specific circumstances. Since the current estimates of risk and hazard for several receptors may be underestimated (see Specific Comment 7 regarding ingestion rate values), cancer risk should be reevaluated for the industrial and construction worker receptor groups before a decision is made about the "acceptability" of estimated risk or hazard. In addition, the potential for excavation of arsenic- and lead-contaminated soils is not discussed. Any potential reduction of risk after soil excavation can, and should, be discussed.

7. **Figure 3-1:** This figure indicates that Sample R2SB26 did not have results for arsenic levels at the surface or subsurface intervals. It is not clear why there were no arsenic results for this sample. Revise the CMS Report to clarify why there were no arsenic results from Sample R2SB26.

8. **Table 3 (Summary of Exposure Factor Input Values) and Section 3.3.1, Ingestion of Soil (pages 7 and 9).** The ingestion rates used to estimate risk and hazard for industrial and construction workers appear low, based on current available guidance documents, and may result in an underestimation of risk and hazard to applicable receptors. U.S. EPA's *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (U.S. EPA, December 2002) provides an ingestion rate for a construction worker receptor of 330 milligrams per day (mg/d). This is significantly greater than the ingestion rate used in the CMS Report of 100 mg/d. Based on the probability of a similar exposure, the ingestion rate for a utility worker should probably be the same as, or close to, the values used for a construction worker in the absence of compelling site-specific information to the contrary. The incidental soil ingestion rate used for estimating exposure to a landscaper/groundskeeper receptor also appears low. The value of 50 mg/d used in the CMS Report appears to be based on a generic industrial worker receptor who spends a majority of the work day indoors. However, the nature of groundskeeping work would indicate the use of an ingestion rate for an outdoor industrial worker. An incidental soil ingestion rate of 100 mg/d is provided in the *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (USEPA, 2002). Revise the CMS Report and the calculation of risk and hazard using more appropriate values (or the values cited herein) for the soil ingestion rates.

MINOR COMMENT

1. **Figure 3-1:** This figure shows two sampling points labeled R2SB29. It appears that one of these sampling locations should be labeled as R2SB30. Revise the CMS Report to correct this apparent discrepancy.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

November 5, 2003

REPLY TO THE ATTENTION OF: **DE-9J**

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Matthew A. Love
Manager-Regulatory Affairs
Exide Corporation
645 Penn Street
Reading, PA 19612-4205

Corrective Measures Study Workplan
Refined Metals Corporation
IND 000 718 130

Dear Mr. Love:

The United States Environmental Protection Agency (U.S. EPA) has completed the review of the October 16, 2003, response to the U.S. EPA's September 3, 2003 conditional approval of the Corrective Measures Workplan for the Refined Metals Corporation facility. We disagree with your response in item number 9 of your October 2003 submittal and we continue to insist that MW-04 is located at a distance that will not allow for immediate detection of any releases directly downgradient of the onsite lagoon. Based on the scale of 1" = 180' provided in Figure 2-2 of the site plane, MW-03 is located at a distance of 270 feet from the lagoon. The distance between MW-6S (closest well to the lagoon) and MW-04 is approximately 450 feet. Incidently, MW-6S is located directly east of the lagoon and not southeast. MW-03 was suggested as a reference point in our letter to facilitate the location of an additional well directly southeast of the lagoon and between MW-6S and MW-04. An additional well must be installed directly southeast between MW-6S and MW-04 and downgradient of the onsite lagoon. This additional well must be installed during the corrective measures phase at the facility.

If you have any questions, I can be reached at (312) 886-7954.

Sincerely,

Jonathan Adenuga

Corrective Action Section
Enforcement Compliance Assurance Branch

cc: John Koehnen, Techlaw Inc.,
cc: Rebecca Joniskan, IDEM

Refined Metals Corporation

October 16, 2003

United States Environmental
Protection Agency – Region V
RCRA Enforcement Branch
77 W. Jackson Street, HRE-8J
Chicago, IL 60604-3590
Attn: Mr. Jonathan Adenuga

Re: Conditional Approval Letter for the CMS Work Plan
Refined Metals Corporation
Beech Grove, Indiana

Dear Mr. Adenuga,

Please find enclosed Refined's responses to EPA comments issued on September 3, 2003 regarding Version 1.0 of the Corrective Measures Work Plan. I certify under penalty of perjury that the information contained in or accompanying the responses is, to the best of my knowledge after thorough investigation, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

REFINED METALS CORPORATION

Matthew A. Love

Enclosure

cc: Rebecca Joniskan – IDEM (w. encl.)

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October 16, 2003 2003-1046-04

Mr. Jonathan Adenuga
Corrective Action Section
Environmental Protection Agency, Region 5
77 West Jackson Boulevard
Chicago, IL 60604-3590

RE: Conditional Approval Letter for the CMS Work Plan
Refined Metals Corporation
Beech Grove, Indiana

Dear Mr. Adenuga:

Thank you for your conditional approval letter (dated September 3, 2003) for the Corrective Measures Study Work Plan prepared by Advanced GeoServices Corp. (AGC), on behalf of Refined Metals Corporation (RMC), for the RMC facility in Beech Grove, Indiana (IND 000 718 130). In that letter, 8 of the 11 comments from the United States Environmental Protection Agency (USEPA) were that the response provided as part of the July 11, 2003 version of the Work Plan appeared to adequately address earlier comment from USEPA. The remaining comments also indicated that the July 11, 2003 responses appeared adequate, although some response was required. Presented herein, are the responses prepared by AGC on behalf of RMC. The responses are number to correspond to the September 3, 2003 letter.

2. If a deed restriction is placed on the property, then a Health and Safety Plan (HASP) will be prepared to address future exposure risks at the Site. During the Risk Assessment, a color coded map showing the three on-site exposure areas will be provided to facilitate interpretation.

8. Your reference to the *USEPA Exposure Factors Handbook* is appreciated. The risk assessment will reference the handbook during the selection of exposure parameters.

9. The locations of MW-3 and MW-6S are located within 75 feet from SWMUs 6 and 9 respectively. AGC and RMC believe that these are ideally located to monitor the individual SWMUs and that the site wide approach to groundwater (i.e., groundwater is not being evaluated on a SWMU by SWMU basis, but rather the Site is being evaluated as a single entity) justifies the exisitng Monitoring Well Network site wide.

Evaluation of the area between MW-3 and MW-6A relative to the shallow groundwater potentiometric map shows that the groundwater monitoring well network is adequate and no additional wells are required.

At this time, AGC has already commenced with implementation the additional investigation activities proposed in the July 11, 2003 version of the Work Plan. Once those results are reported from the lab and validated, a summary report will be prepared and submitted for your use. If you have any questions, please call us at 610-840-9122.

Sincerely,

ADVANCED GEOSERVICES CORP.

Paul G. Stratman, P.E., P.G.
Senior Project Consultant

PGS:vm

cc: Rebecca Joniskan, IDEM
Matthew Love, Exide

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

September 3, 2003

REPLY TO THE ATTENTION OF **DE-9J**

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Matthew A. Love
Manager-Regulatory Affairs
Exide Corporation
645 Penn Street
Reading, PA 19612-4205

Corrective Measures Study Workplan
Refined Metals Corporation
IND 000 718 130

Dear Mr. Love:

The United States Environmental Protection Agency (U.S. EPA) has completed the review of the revised April 21, 2003, Corrective Measures Study (CMS) Workplan for the Refined Metals Corporation. U.S. EPA is providing you with **a conditional approval** . The attached comments must be fully addressed prior to final approval of the CMS workplan. All changes and necessary attachments addressing U.S. EPA comments will be incorporated in the final CMS Workplan. However, Pending final approval, RMC could proceed with the activities proposed in the CMS workplan. As indicated, issues adequately addressed have been acknowledged. Also, outstanding issues to be addressed have been outlined in the enclosed Attachment. The revised Workplan must be submitted to U.S. EPA for review within 30days of receipt of this letter. If you have any questions, I can be reached at (312) 886-7954.

Sincerely,

Jonathan Adenuga
Corrective Action Section
Enforcement Compliance Assurance Branch

cc: John Koehnen, Techlaw Inc.,
cc: Rebecca Joniskan, IDEM

ATTACHMENT

EVALUATION OF THE RESPONSE TO COMMENTS FOR THE CORRECTIVE MEASURES STUDY WORK PLAN DATED JULY 11, 2003

REFINED METALS CORPORATION BEECH GROVE, INDIANA EPA ID ID000718130

1. **Response to Comment 1:** This response appears to be adequate.

2. **Response to Comment 2:** This response appears to be adequate. However, if a deed restriction is necessary in the future, it should be ensured that the Health and Safety Plan ensures protection from all associated risks at the site. Also, RMC is proposing to conduct a baseline human health risk assessment and also proposes to divide the facility into 3 exposure and receptor areas. Since the entire waste management area boundary, primarily on the northeastern to the southeastern portions of the site has not been clearly defined, RMC must provide a color coded map of these 3 areas to evaluated during the risk assessment.

3. **Response to Comment 3:** This response appears to be adequate.

4. **Response to Comment 4:** This response appears to be adequate.

5. **Response to Comment 5:** This response appears to be adequate.

6. **Response to Comment 6:** This response appears to be adequate.

7. **Response to Comment 7:** This response appears to be adequate.

8. **Response to Comment 8:** The rationale provided for the use of the selected exposure parameters is reasonable and adequate. The response indicates that there are no guidance documents in existence which provide suggestions for exposure parameters appropriate

for adoloescent trespassers and groundskeepers. However, U.S. EPA's *Exposure Factors Handbook* (U.S. EPA Office of Research and Development, 1997) provides age- and activity-specific guidance on the selection of exposure parameters such as soil ingestion rates, inhalation rates and exposed skin area. The EFH summarizes data from studies documented in scientific literature and presents recommendations for exposure factors that can be used in a variety of site- or situation-specific scenarios. It is recognized that exposure frequency and exposure duration are site-specific parameters that should be selected based on the professional judgement of someone familiar with the site. However, it is suggested that the EFH be referenced when selecting the remaining exposure parameter values to be used in the evaluation of risk and hazard to adolescent trespassers and grounds keepers at the Refined Metals facility.

9. **Response to Comment 9:** In general, this response appears to be adequate and the additional groundwater characterization proposed is acceptable, MW-04 is located in the southeastern portion of the site and located at a distance that will not allow for immediate detection of any releases. The potential for contamination to migrate downgradient between wells exist. RMC must install wells capable of immediate detection of any releases between MW-6SR and MW-03 in the southeastern portion of the waste management area.

10. **Response to Comment 10:** This response appears to be adequate.

11. **Response to Comment 11:** This response appears to be adequate.

ADVANCED GEOSERVICES CORP. *"Engineering for the Environment"™*

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West Chester, PA 19380-4293
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July 11, 2003 2003-1046-04

Mr. Jonathan Adenuga
Region 5 Corrective Action Section
US Environmental Protection Agency
77 West Jackson Boulevard
Chicago, IL 60604-3590

RE: Corrective Measures Study Work Plan
Response to Comments
Refined Metals Corporatin
IND 000 718 130

Dear Mr. Adenuga:

On behalf of Refined Metals Corporation, Advanced GeoServices Corp. (AGC) submits the following response to comments for the Corrective Measures Study Work Plan dated April 21, 2003. The comment letter provided by USEPA was dated June 4, 2003. The Corrective Measures Study Work Plan has been revised (Revision 1.0) in response to theses comments and is enclosed.

USEPA COMMENTS

Comment: **The vertical extent of on-site soil contamination and horizontal extent of off-site soil contamination to the east of the site still appears to be unclear. No additional sampling is proposed in these areas of uncertainty. While the proposed additional sampling of the railroad right-of-way and the ditch along Arlington Avenue should be adequate to delineate contamination in these areas, it should be noted that RMC may still need to conduct cleanup activities in deeper soils and off-site to the east in order to reach cleanup goals in the future. The Work Plan does not specify how the results of the CMS Phase I activities (additional sampling and risk analysis) will be reported. The results of these activities should be provided to USEPA when they are completed, prior to evaluation of potential corrective measures. Revise the Work Plan to include a report outline for the Phase I CMS activities.**

Response: An interim (Phase I CMS Report) report will be prepared following receipt of the analytical data from the Phase I CMS sampling activities that describes the data collection techniques and results and discusses the preliminary results of the human

health risk assessment. This report will be provided to the U.S. EPA prior to initiating the evaluation of potential corrective measures.

Section 6.2 of the CMS Work Plan has been revised to include an outline for the Phase I CMS Report.

Comment: **Section 2.1, Description of Current Situation, Page 2-3: The last paragraph of this page appears to indicate that RMC assumes exposures in the plant area will only be related to subsurface digging. It is also assumed that the buildings and pavement will be in place for all potential future exposures. In order to ensure that the appropriate paved areas and buildings covering the soils are maintained to prevent future exposures, a discussion of the types of institutional controls that will be implemented should be provided. Revise the Work Plan to include a description of the proposed institutional controls and, if necessary, any information on how they will be implemented.**

Response: The text of Section 2.1 of the Work Plan has been revised to include a statement specifying that, if required, a Deed Notice will be recorded to maintain the existing cover in order to prevent exposure to underlying affected-soil.

Comment: **Section 2.2, Establishment of Corrective Action Objectives: One of the objectives of the corrective action is to reduce risk to human health and the environment. However, the main objective is to screen and implement a remedy capable of eliminating current and future unacceptable risk that potentially could result from the contaminants detected in the soils and groundwater at the facility.**

Response: The text of Section 2.2 has been revised to clearly indicate that the main objective to identify a remedy that will eliminate current and future unacceptable risk from exposure to soil or groundwater contamination at the site.

Comment: **Section 2.3, Phase I Corrective Measures Study, Page 2-5: The second paragraph of this section indicates that additional sampling locations will be identified as R2SED 11 through R2SED 14 and will be established using a 75-foot spacing along the center of the drainage ditch. However, the depths of these sediment samples are not specified. Revise the Work Plan to include the depths of the proposed sediment samples.**

Response: The text in the second paragraph of Section 2.3 has been revised to specify that samples will be collected at depths of 0-6 and 6-12 inches in each of additional borings R2SED11 through R2SED14.

Comment: **Section 2.3, Phase I Corrective Measures Study, Page 2-6: The first paragraph of this page indicates that sampling protocols previously used at the site will be followed. In order to ensure that proper sediment sampling, groundwater sampling, and piezometer and monitoring well installation protocols are followed, complete standard operating procedures (SOPs) should be provided. Alternatively, references to previous documents where these SOPs are located could be provided. Revise the Work Plan to either include the SOPs or to provide a complete list of references as to where they can be found.**

Response: A paragraph has been added to the text of Section 2.3 that specifies sediment and groundwater samples will be collected using the same protocols previously used at the site and identifying the sections in the Phase II RFI Work Plan were these protocols have been described.

Comment: **Section 2.3, Phase I Corrective Measures Study, Page 2-6: The first paragraph of this page indicates that up to three temporary piezometers may be installed to assist in determining where two new monitoring wells should be installed. However, it appears that the proposed piezometer locations are not provided in the Work Plan. In addition, the Work Plan does not indicate how the information gained from the piezometers will be used to determine monitoring well locations. For clarification, revise the Work Plan to show or explain approximately where the piezometers will be located and how they will be used to determine monitoring well locations.**

Response: Potential piezometer locations have been added to Figure 4-1 of the Work Plan. Actual locations will be selected in the field based on access by drilling equipment, but all locations will be located north or east of the former area of operations. Groundwater levels obtained from the piezometers will be used to refine groundwater contours and assist with selection of the location for new wells.

Comment: **Section 2.4.1 Exposure Pathways and Receptors, Facility Area, Page 2-7: The only receptor being evaluated for the facility area is a future utility worker. However, it is also appropriate to evaluate a future construction worker. A construction worker will also be exposed to subsurface soils, but will have a different exposure frequency and exposure duration. Revise the Work Plan to indicate that a**

construction worker receptor will also be evaluated in the CMS, or provide adequate justification for excluding this receptor from analysis.

Response: Subsection 2.4.1 has been revised to include a Construction worker in the risk assessment. The basis for exposure has been taken as a construction worker performing excavation and earthwork operations (such as those associated with building construction) in the surface and subsurface soils for a duration of 8 hours per day for 50 days per year (10 work weeks) for 5 years.

Comment: **Section 2.4.2, Exposure Pathways and Receptors, Grassy Areas North and South of Main Gate, Page 2-7: This section presents exposure parameters that will be used to evaluate risk and hazard for receptors in the grassy areas north and south of the main gate. However, the source of these exposure paramenters is not provided. Revise this section of the Work Plan to include additional discussion that justifies the use of these exposure parameters. Alternatively, provide a literature or USEPA guidance source (such as *Risk Assessment Guidance for Superfund [RAGS]*) which recommends the use of these exposure parameters.**

Response: The exposure frequency and durations presented in sub-section 2.4.2 were developed based on professional judgement of the risk assessors, as no specific guidance addresses these scenerios. The exposure frequency for the adolescent trespasser as proposed would represent a 4 hour visit to the site every other week for 5 years. Considering the proximity of residential properties, the presence of a security fence, visibility from adjacent roads and properties and desirability of the site the adolescent trespasser frequency durations and frequency are considered conservative. The frequency and durations for the groundskeeper was selected assuming that the groundskeeper would be cutting the grass, raking leaves, etc. one day per week for 50 weeks per year. Regarding the site worker, the number of times per year an employee will be frequenting the grass areas for lunch or recreation is also a professional judgement call and as proposed would represent an employee utilizing the area 144 days per year.

Comment: **Section 2.11, Screening of Corrective Measure Technologies, Page 2-12: The last paragraph of this section states that "the additional characterization recommended in the Phase II RFI and a human health risk assessment will be performed as described below." However, a description of the assessments appears to be in Section 2.11, Screening of Corrective Measures Technologies. Revise the Work Plan to clarify the discrepancy.**

Response: The description of the recommended additional characterization and human health risk assessment are contained in Sections 2.3 through 2.9 of the CMS Work Plan. The text of Section 2.11 has been modified to clarify the location of the referenced descriptions.

Comment: **Section 4.1, Technical/Environmental/Human Health/Institutional, Page 4-1: This section indicates that technical considerations for each corrective measure will include performance, reliability, implementability, and safety. While it is understood that each of the corrective measures will be evaluated on these technical considerations, it is unclear how each alternative will be compared to the other alternatives. Revise the Work Plan to clarify how the most adequate alternative will be identified following the technical evaluations.**

Response: Following evaluation of the corrective measures independently, alternatives will be the subject of a comparative analysis to determine the relative performance of one alternative versus the next. Overall protection of human health and the environment and compliance with applicable regulations will be a primary determination with performance, reliability, implementability, and safety being more subjective. The Phase II CMS Report will include a narrative discussion of the comparative analysis presenting the qualitative performance of each alternative. Sections 4.1 and 6.2 of the text have been clarified to reflect this process.

Comment: **Table 1. Receptors and Exposure Pathways: Based on Table 5-1 of the Phase II RFI report, and the USEPA's interpretation, lead, arsenic, and selenium results indicate impact to the groundwater underlying the RMC facility. Those are the constituents of concern to be addressed in the corrective action objectives. The existing buildings and paved surfaces may reduce exposure to contaminated soils beneath them. However, potential cracks within the paved areas and potholes in the plant building floors could also become efficient conduits for surface water migration to the underlying groundwater.**

Therefore, Table 1 of the Corrective Measures Study Work Plan must be revised to include the groundwater medium as an additional exposure area and receptor to be evaluated, if any risk assessment is to be performed. Table 1 also presents exposure parameters that will be used to evaluate risk and hazard for receptors at the site. However, the source of these exposure parameters is not provided. Revise Table 1 to include information regarding the source(s) of exposure parameters.

Response: The Beech Grove community, including the Site is serviced by public water supply of which 80% is obtained from the White River Sand and Gravel aquifer which is located no closer than 5.3 miles west of the Site. In the general vicinity of the site, hydrogeologic mapping has identified three semi confined aquifers, only two of which extend beneath the site itself (Meyer, 1975). The shallowest of these aquifers is situated at approximately 120 feet below ground surface (bgs) and the deepest is located approximately 180 feet bgs. The "shallow" and "deep" monitoring wells have been installed on-site, with the deep wells evaluating the shallowest of the two mapped semi-confined aquifers at 120 feet bgs, and the shallow wells representing a discontinuous perched zone at approximately 10 bgs.

Previous groundwater sampling, performed as part of the Phase I RFI, has eliminated the deep wells from further evaluation and the focus of the Phase II RFI was the discontinuous perched aquifer typically at depths of 10 feet bgs which are not used for water supply. Because the perched aquifer is not used for water supply and does not discharge to a receptor at the Site no complete exposure pathway exists that could be the subject of a risk assessment..

If you have any questions, or require additional information, please call me at (610) 675-2122. We look forward to moving forward with this project.

Sincerely,

ADVANCED GEOSERVICES CORP

Paul G. Stratman, P.E.
Senior Project Consultant

PGS:cf

Enclosure

cc: Matthew Love (Exide)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

June 4, 2003

REPLY TO THE ATTENTION OF **DE-9J**

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Matthew A. Love
Manager-Regulatory Affairs
Exide Corporation
645 Penn Street
Reading, PA 19612-4205

Corrective Measures Study Workplan
Refined Metals Corporation
IND 000 718 130

Dear Mr. Love:

The United States Environmental Protection Agency (U.S. EPA) has completed the review of the April 21, 2003, Corrective Measures Study Workplan for the Refined Metals Corporation. The Workplan must be revised to address comments in the enclosed Attachment and submitted to U.S. EPA for review within 30days of receipt of this letter. If you have any questions, I can be reached at (312) 886-7954.

Sincerely,

Jonathan Adenuga
Corrective Action Section
Enforcement Compliance Assurance Branch

cc: John Koehnen, Techlaw Inc.,
cc: Rebecca Joniskan, IDEM

ATTACHMENT

GENERAL COMMENT

1. The vertical extent of on-site soil contamination and horizontal extent of off-site soil contamination to the east of the site still appears to be unclear. No additional sampling is proposed in these areas of uncertainty. While the proposed additional sampling of the railroad right-of-way and the ditch along Arlington Avenue should be adequate to delineate contamination in these areas, it should be noted that RMC may still need to conduct cleanup activities in deeper soils and off-site to the east in order to reach cleanup goals in the future. The Work Plan does not specify how the results of the CMS Phase I activities (additional sampling and risk analysis) will be reported. The results of these activities should be provided to U.S. EPA when they are completed, prior to evaluation of potential corrective measures. Revise the Work Plan to include a report outline for the Phase I CMS activities.

SPECIFIC COMMENTS

1. **Section 2.1, Description of Current Situation, Page 2-3:** The last paragraph of this page appears to indicate that RMC assumes exposures in the plant area will only be related to subsurface digging. It is also assumed that the buildings and pavement will be in place for all potential future exposures. In order to ensure that the appropriate paved areas and buildings covering the soils are maintained to prevent future exposures, a discussion of the types of institutional controls that will be implemented should be provided. Revise the Work Plan to include a description of the proposed institutional controls and, if necessary, any information on how they will be implemented.

2. **Section 2.2, Establishment of Corrective Action Objectives:** One of the objectives of the corrective action is to reduce risk to human health and the environment. However, the main objective is to screen and implement a remedy capable of eliminating current and future **unacceptable** risk that potentially could result from the contaminants detected in the soils and groundwater at the facility.

3. **Section 2.3, Phase I Corrective Measures Study, Page 2-5:** The second paragraph of this section indicates that additional sampling locations will be identified as R2SED 11 through R2SED 14 and will be established using a 75-foot spacing along the center of the drainage ditch. However, the depths of these sediment samples are not specified. Revise

the Work Plan to include the depths of the proposed sediment samples.

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8. **Section 2.11, Screening of Corrective Measure Technologies, Page 2-12:** The last paragraph of this section states that "the additional characterization recommended in the Phase II RFI and a human health risk assessment will be performed as described below." However, a description of the assessments appears to be in Section 2.11, Screening of Corrective Measures Technologies. Revise the Work Plan to clarify the discrepancy.

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performance, reliability, implementability and safety. While it is understood that each of the corrective measures will be evaluated on these technical considerations, it is unclear how each alternative will be compared to the other alternatives. Revise the Work Plan to clarify how the most adequate alternative will be identified following the technical evaluations.

10. **Table 1, Receptors and Exposure Pathways:** Based on Table 5-1 of the Phase II RFI report, and the U.S. EPA's interpretation, lead, arsenic and selenium results indicate impact to the groundwater underlying the RMC facility. These are the constituents of concern to be addressed in the corrective action objectives. The existing buildings and paved surfaces may reduce exposure to contaminated soils beneath them. However, potential cracks within the paved areas and potholes in the plant building floors could also become efficient conduits for surface water migration to the underlying groundwater.

    Therefore, Table 1 of the Corrective Measures Study Workplan must be revised to include the groundwater medium as an additional exposure area and receptor to be evaluated, if any risk assessment is to be performed. Table 1 also presents exposure parameters that will be used to evaluate risk and hazard for receptors at the site. However, the source of these exposure parameters is not provided. Revise Table 1 to include information regarding the source(s) of exposure parameters.